A CBO STUDY

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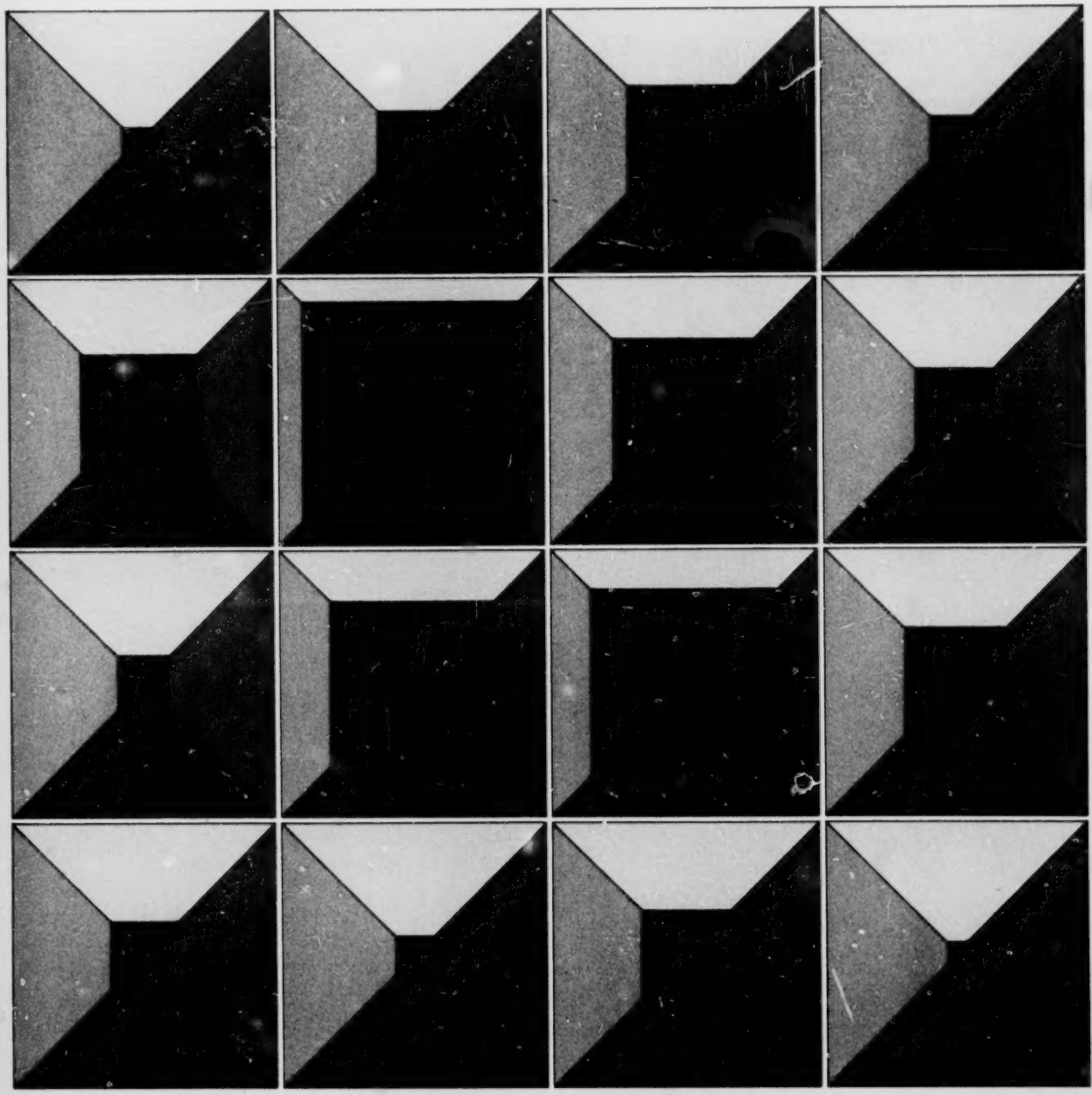
Federal Subsidies for Rail Passenger Service: An Assessment of Amtrak

Congress of the United States
Congressional Budget Office



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FEDERAL SUBSIDIES TO RAIL PASSENGER SERVICE:

AN ASSESSMENT OF AMTRAK

The Congress of the United States
Congressional Budget Office

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NOTE

Unless otherwise noted, all dollar numbers in this paper are in current year dollars.

PREFACE

In recent years, the federal government's subsidy to Amtrak has been the focus of considerable debate both within the Congress and between the Legislative and Executive Branches. As the Congress contends with increasing budgetary pressures and assesses competing spending priorities, questions about the appropriate funding level for Amtrak will undoubtedly arise again. To assist the Congress in its deliberations, the Congressional Budget Office has prepared this analysis of the Amtrak system and its reliance on federal support.

Sally A. Ferris, currently my special assistant, wrote this study under the supervision of David Bodde and Damian Kulash of CBO's Natural Resources and Commerce Division. The author gratefully acknowledges the helpful comments and contributions of Allen Kraus and Richard Weissbrod, both formerly of CBO. Valuable contributions also were made by Amy Dines, John Hamre, Richard Mudge, and Raymond Scheppach of CBO. Johanna Zacharias edited the manuscript. Paula Mills typed the many drafts and prepared the paper for publication. In keeping with CBO's mandate to provide objective analysis, this paper offers no recommendations.

Alice M. Rivlin
Director

July 1982

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NOTE: A map of Amtrak's route network is provided inside the back cover of this paper.

SUMMARY

Amtrak's fiscal year 1983 funding level was the focus of considerable Congressional debate during last year's legislative session. President Reagan had requested substantial reductions in federal subsidies for Amtrak. After prolonged deliberation, the Congress did reduce Amtrak subsidies, though not to the extent the President had proposed. Moreover, Amtrak was excused from several of its financial obligations.

This year, President Reagan has again proposed substantial reductions in Amtrak subsidies, requesting a fiscal year 1983 funding level of $600 million--$188 million below the 1983 level the Congress authorized last year. Thus, he Congress may again face questions of whether sizable subsidies to Amtrak are warranted and how, in light of increasing budgetary pressures, they might be reduced.

As the Congress continues to examine federal spending priorities in general and in particular, alternate funding levels for Amtrak, several issues will emerge:

- Does the national interest in Amtrak justify the sytem's federal support?
- Can subsidies be reduced without Amtrak's curtailing services?
- If services must be reduced or eliminated, which are the least cost effective? And how should these be identified?
- Could significant savings be realized through selected service reductions?

THE FEDERAL INTEREST IN AMTRAK

Public intervention in private-sector commercial undertakings is generally deemed appropriate when a particular product or service that benefits the public is not adequately provided by the private market. Proponents of Amtrak's federal subsidy argue that rail passenger service conveys many important public benefits, which justify continuing federal support. Subsidies to Amtrak, proponents argue, promote equity by placing rail passenger service--which is virtually synonymous with Amtrak--on a competitive

footing with the other modes of transportation receiving federal subsidies, encourage an energy-efficient means of travel, provide transportation for low-income people, and insure against transportation emergencies arising from such events as acute oil shortages, work stoppages against other modes, or national security crises. They also cite the recreational opportunities Amtrak offers and its role as a historic link with the nation's past.

Equity With Other Modes

Though all transportation modes receive some federal support, subsidies to Amtrak are exceptionally large relative to the volume of traffic the system carries. Of the $10.9 billion in gross fiscal year 1980 federal expenditures for intercity passenger transportation, rail passenger service received 10 percent. Taking into account the receipts from users, Amtrak received fully 31 percent of the $3.4 billion net federal transportation expenditures. At the same time, however, Amtrak carried less than 1 percent of all intercity passenger traffic. Per passenger mile, Amtrak received 23.6 cents in net federal subsidies--far in excess of the 4.9 cents per passenger mile provided to general aviation, the 0.2 cent going to commercial aviation, and the 0.1 cent subsidy to passenger cars and intercity buses. Moreover, the federal government pays an exceptionally large share of total rail passenger costs.

Energy Conservation

On the Northeast Corridor (the network of routes linking points from Washington, D.C. with Boston by way of New York City), rail saves an average of 544 BTUs per passenger mile, but it loses 1,267 BTUs per passenger mile elsewhere. The average trip along the Northeast Corridor in 1980 therefore saved 54,400 BTUs, or almost three and a half pints of gasoline, while the average trip outside the Northeast Corridor lost 424,965 BTUs, or approximately three and a half gallons of gasoline.

Even assuming improved efficiency in the future, the Northeast Corridor rail service will yield only limited energy savings--1,162 BTUs per passenger mile diverted to rail from other modes--while the rest of the system will incur an energy loss. The rail passenger system as a whole will yield a net energy loss.

Of particular concern, however, is petroleum-based energy consumption. Most intercity transportation modes depend largely on petroleum. The notable exception is rail service in the Northeast Corridor. About half of all rail propulsion energy in the Northeast Corridor is currently derived

from electricity generated by coal-fired or nuclear generators. Amtrak service on the Northeast Corridor therefore conserves small amounts of petroleum--about 1,800 BTUs per passenger mile. Even with significant improvements in the future, however, Northeast Corridor operations could save only 1,773 barrels of oil per day--less than 0.01 percent of the nation's daily consumption of petroleum.

Other means of conservation--notably, the improved fuel economy of cars and the production of synthetic fuels--have the potential to save far greater amounts of oil at appreciably lower costs.

As a Stopgap During Acute Oil Shortages

During an acute oil shortage, Amtrak could partly fill the gap left by reduced auto and air service, generally the two most energy-consuming modes. Nevertheless, Amtrak's capacity to provide mobility would be restricted by its limited service network and capacity. Amtrak serves only 495 points nationwide and has the capacity to carry only a very small proportion of total intercity travel--less than 1 percent. Moreover, Amtrak could save at most 1,886 barrels of petroleum a day, or 688,390 barrels a year--less than 0.02 percent of current consumption levels. These savings would thus do little to offset a significant shortfall in oil supplies, particularly in comparison to other measures such as stockpiling oil in the Strategic Petroleum Reserve.

Reductions in Other Common Carrier Services

Strikes or other disruptions affecting other common carriers--that is, airlines or bus companies--could make Amtrak an important back-up means of travel. The amount of insurance Amtrak could offer is limited, however. Fully 84 percent of all U.S. intercity travel--the automobile's share--would not be directly affected by a reduction in common carrier service. Moreover, most passengers displaced from buses or airplanes would probably resort to traveling by car. Even with markedly increased demand for common carrier service, however, Amtrak would be able to meet only 4 percent of the total demand.

For Purposes of National Security

Railroads served crucial defense roles during both World Wars. Such a military role for the railroads is now much diminished, however, by large-scale highway construction and the evolution of a nationwide airway

network. Nevertheless, some of Amtrak's advocates argue that the operation of Amtrak helps to maintain a national network of rail roadbed and track and therefore is important to national defense. In reality, however, track quality usually more nearly reflects the importance of a given track segment to freight operations, rather than to passenger service. To the extent that rail passenger service does result in facility improvements, the nature of these improvements--signalling and communications systems, curve banking, and so forth--are generally such that non-passenger operations do not benefit directly. Moreover, many of the rail routes that might hold special defensive significance are low-volume spurs or branchlines not used by Amtrak at all.

As a Means of Travel for Low-Income People

All transportation subsidies tend to aid more affluent persons rather than low-income persons, because higher-income people travel far more. Transportation modes differ, however, in the income groups they serve. Airlines, for instance, carry disporportionately many high-income persons. Intercity buses carry disproportionately many low-income persons. Rail carries a larger proportion of low-income persons than either air or auto, although still far less than proportional to the population at large. At the same time, rail carries a relatively high proportion of high-income persons. In general, therefore, subsidies to air, auto, and rail service all tend to benefit higher-income travelers more than lower-income ones.

Historic and Recreational Value

Rail passenger service offers recreational benefits and stands as a historical link with the nation's past. Such assets do not lend themselves to being numerically quantified or analytically assessed, however.

PROSPECTS FOR IMPROVED FINANCIAL PERFORMANCE

Amtrak's subsidies have increased considerably during the system's ten-year existence. In real terms, annual federal support (excluding funding for the Northeast Corridor purchase and improvements) increased more than three-fold since Amtrak's inception. Very substantial cost reductions or revenue increases would be necessary to modify Amtrak's subsidy needs significantly.

Amtrak's costs are high relative to the traffic volume carried. In fiscal year 1980, Amtrak's costs averaged $54 per passenger carried and 25 cents per passenger mile carried. Moreover, Amtrak suffers under a

significant cost disadvantage vis-a-vis other intercity passenger carriers. Amtrak's cost per passenger mile carried in fiscal year 1980 was about 25 cents, compared with bus's 8 cents and air's 12 cents. To the extent that other carriers can operate at lower costs than Amtrak, they can offer competitive services at lower prices, consequently forcing Amtrak to price its services below its costs. Large operating deficits can thereby result.

Amtrak's high costs per passenger mile are generally attributed to the interaction of three elements: low load factors, high labor costs, and high capital intensiveness. Improvements in these areas have only limited potential to alter Amtrak's subsidy needs, however.

Amtrak's costs per passenger mile could indeed be lowered by improved load factors (that is, proportions of all seats actually occupied by passengers). These reductions would not be sufficient, however, to offset the cost advantage held by the other common carriers. Even if Amtrak's average load factor increased dramatically from 48 percent to 75 percent, its cost per passenger mile would still far exceed that of bus and air. The system's heavy reliance on federal subsidies would only be marginally affected. This is reflected in Amtrak's cost per seat mile, which is three times greater than bus's and 50 percent greater than air's.

Nor could labor costs be reduced enough to offset Amtrak's significant cost disadvantage. Even if Amtrak's labor costs were halved, its costs per passenger mile would still exceed those of air and bus. Moreover, such large labor cost cuts or productivity improvements (without accompanying reductions in service) would be extremely difficult to achieve. Amtrak recently announced wage settlements with six unions, which according to Amtrak estimates, could save about $132 million over the next three years--only about 6 to 7 percent of Amtrak's total labor bill.

Substantially improved equipment utilization rates are for the most part precluded by the inherent capital intensiveness of rail operations. Such improvements therefore do not hold significant potential for improving Amtrak's cost structure.

Increased Amtrak revenues could come from augmented ridership and higher fares. As the growth in intercity travel continues to slow, however, Amtrak must expand its market share if it is to attract substantially more riders. This prospect appears unlikely. Amtrak would either have to improve service and/or lower fares in order to attract more riders. Amtrak has already made substantial improvements in equipment, punctuality, and service; further improvements will be increasingly costly. Likewise, although Amtrak could probably augment its revenues through fare increases, competition from other modes and resulting patronage losses

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substantially limit the extent to which this gain is practicable. Amtrak's revenues per passenger miles in fiscal year 1980 were already 2 cents higher than bus's and only 2 cents lower than air's. Nevertheless, the push to recover a larger share of costs through revenues is likely to force a steep increase in Amtrak fares over the next several years. Though these fare increases would contribute to increased revenues, offsetting declines in ridership are likely to limit net revenue gains.

Although there is some potential for reducing Amtrak's future dependence on federal subsidies by cutting costs or increasing revenues from existing services, that potential is likely to be marginal and holds little prospect for substantially reducing Amtrak's subsidy needs. The need for subsidies can be reduced substantially only by trimming services.

AMTRAK'S PERFORMANCE BY TYPE OF SERVICE

Any assessment of the performance of Amtrak services necessarily turns on identifying each service's costs, revenues, losses, and ridership. Allocating costs, revenues, and passengers across a system of interconnecting routes is difficult and requires some arbitrary assumptions. The critical issue, though, is the sensitivity of the resulting measures of individual route or service performance to different allocation methods. Different techniques and assumptions can have a significant impact on the measured performance of individual Amtrak routes. Moreover, repeated adjustments in Amtrak's allocation or accounting methods make year-to-year comparisons of a given route's performance difficult. For example, much of the apparent improvement (between fiscal years 1980 and 1981) in Amtrak's performance on various routes seems to stem from adjustments in Amtrak's allocation method, not from real declines in financial losses or increases in ridership. Comparisons of Amtrak's performance across routes and years should thus be made with an awareness of the distortions that can arise from different allocation and accounting methods. Despite these problems, however, Amtrak's route-by-route data provide the best information now available for evaluating and comparing the relative performance of different Amtrak services.

In assessing the performance of different Amtrak services, a range of measures offers helpful insights. A balanced assessment of the performance of various Amtrak routes requires a review of all performance measures. The Summary Table displays the performance of the various components of the Amtrak route system on the basis of several measures.

As a group, the Northeast Corridor routes generally outperform all the other short-distance and the long-distance routes. Corridor routes carry

more passengers, they require smaller subsidies per passenger, and they recover a higher fraction of their costs from fares and local subsidies. At the same time, the other short-distance routes outperform the long-distance routes on several measures. Short-distance routes account for a smaller share of the fully allocated loss and the avoidable federal loss, and they require smaller subsidies per passenger. They also recover somewhat more of their costs through fares and local subsidies. The long-distance routes carry the greatest number of passenger miles and have the highest passenger miles per train mile. The subsidy per passenger mile on long-distance routes was generally lower than on short-distance or Northeast Corridor routes.

EFFECTS OF SERVICE REDUCTIONS ON AMTRAK'S SUBSIDY NEEDS

The amount of savings that could be realized through Amtrak service reductions can be estimated only roughly. Such estimates must derive from identifying the costs, revenues, and losses of each Amtrak service and the portions of those costs and losses that could be avoided by service terminations. Ascribing costs to individual routes and classifying these costs as avoidable or fixed is imprecise, however. Moreover, the estimated savings that would accompany Amtrak service reductions are very sensitive to these cost definitions and allocation methods.

Amtrak could substantially reduce its subsidy needs through selected service reductions. The extent and specifics of particular service reductions would determine the amount of savings Amtrak could realize. In general, however, the largest savings could be achieved by eliminating or reducing long-distance service, since these routes account for the largest proportion of Amtrak's estimated avoidable loss--77 percent in fiscal year 1981.

Any savings realized by service reductions would be offset, at least partly, by labor protection payments to displaced workers and other system shut-down costs. These offsetting cost increases would only be one-time or temporary expenses, however, while the savings would be permanent.

SUMMARY TABLE. AMTRAK PERFORMANCE ACCORDING TO VARIOUS MEASURES, BY TYPE OF SERVICE (Fiscal years 1980 and 1981)

Performance Measure	Fiscal Year 1980			
	Total Amtrak System	Long Distance Routes	Short Distance Routes	North-east Corridor Routes
Passengers (In millions)	21.16	5.77	4.61	10.78
Passenger Miles (In billions)	4.56	2.90	0.58	1.08
Passenger Miles per Train Mile	153	175	94	153
Avoidable Federal Profit (Loss) (In millions of dollars)	(197.6)	(172.5)	(31.6)	6.6
Fully Allocated Federal Profit (Loss) (In millions of dollars)	(675.3)	(453.6)	(95.7)	(126.0)
Federal Subsidy per Passenger (In dollars)	31.92	78.62	20.76	11.69
Federal Subsidy per Passenger Mile (In dollars)	0.148	0.157	0.164	0.116
Percent of Costs Recovered From Passenger Revenues and Local Subsidies	38.2	34.1	37.9	49.7

(Continued)

NOTE: Dollars expressed in current dollars.

SUMMARY TABLE. (Continued)

Performance Measure	Fiscal Year 1981			
	Total Amtrak System	Long Distance Routes	Short Distance Routes	North-east Corridor Routes
Passengers (In millions)	20.55	4.71	5.05	10.79
Passenger Miles (In billions)	4.74	2.98	0.67	1.09
Passenger Miles per Train Mile	155	195	91	136
Avoidable Federal Profit (Loss) (In millions of dollars)	(180.7)	(138.8)	(36.0)	(5.9)
Fully Allocated Federal Profit (Loss) (In millions of dollars)	(776.6)	(452.7)	(127.8)	(196.2)
Federal Subsidy per Passenger (In dollars)	37.80	96.17	25.31	18.18
Federal Subsidy per Passenger Mile (In dollars)	0.164	0.152	0.191	0.180
Percent of Costs Recovered From Passenger Revenues and Local Subsidies	38.5	37.1	37.3	42.2

SOURCE: Compiled by the Congressional Budget Office from National Railroad Passenger Corporation information.

FEDERAL SUBSIDIES TO RAIL PASSENGER SERVICE:

AN ASSESSMENT OF AMTRAK

CHAPTER I. INTRODUCTION

The Rail Passenger Service Act of 1970 established the National Railroad Passenger Corporation--Amtrak--to reverse spiraling declines in the nation's intercity rail passenger service and to relieve rail freight companies of the financial burden of operating passenger trains. Rail passenger travel in the United States had begun to fall off in the early 1920s with the proliferation of cars and the development of a federal highway system. The growth of commercial air travel and the introduction of jet aircraft during the late 1950s and early 1960s further aggravated the downward trend in rail passenger service. By 1970, intercity rail passenger service was severely threatened by declining revenues, rising costs, and growing deficits.

The 1970 act launched the federal government on a program to preserve rail passenger service in the United States. It required that Amtrak establish a basic rail passenger route system and empowered the corporation to operate trains--either directly or by contracting with operating railroads--over these routes. Any railroad that had been providing passenger service could join Amtrak by paying a fee (based on the company's 1969 financial losses on its passenger service) in the form of either cash, equipment, or future service obligations. The dozen or so railroads that joined Amtrak were relieved of all further obligation to provide passenger service; those that did not join were required to retain passenger services at least until January 1975. All but five railroads joined, with many paying their fees in the form of equipment. 1/

Amtrak's route structure totaled 23,600 miles at the outset in 1971--somewhat less than half the passenger route mileage that had existed before. Today, the Amtrak system, still totaling more than 23,000 route miles, serves 495 points around the nation and operates an average of 240 trains a day, of which more than half run on the Northeast Corridor. 2/

1. The exceptions were the Southern Railway; the Denver and Rio Grande Western; the Chicago, Rock Island and Pacific; the Georgia Railroad; and the Reading Company.

2. The Northeast Corridor is the 621-mile system of routes connecting Washington, D.C. with Boston by way of New York City and numerous other intervening points (see Amtrak route map at the back of this paper), and comprising two spurs, one from New Haven to Springfield and one from Philadelphia to Harrisburg.

Amtrak is now essentially the sole provider of intercity passenger rail service in the United States--the only other being the Denver and Rio Grande Western, which operates service between Ogden, Utah and Denver, Colorado. Nonetheless, Amtrak currently carries less than 1 percent of total domestic intercity travel by all modes of transportation.

Most Amtrak services--except those along the Northeast Corridor--are supplied under contract by independent operating railroads. These railroads furnish engineers, train operating crews, and maintenance services to move the passenger trains that Amtrak owns. The operating railroads are also responsible for maintaining track and roadbed and for coordinating the traffic flow on all routes outside the Northeast Corridor.

Amtrak was initially envisioned as a self-supporting corporation. The Congress provided a start-up grant of $40 million and authorized federal loans of $100 million to fund initial capital expenses. (Additionally, railroads that were relieved of their passenger-carrying obligations paid Amtrak a total of $197 million in compensation.) This funding was viewed as one-time, transitional aid that would enable numerous disparate and unprofitable rail passenger services to combine into one coordinated, profitable system.

Despite the Congress' intent to form a self-supporting corporation, Amtrak has never covered its costs with passenger revenues; rather, its chronic unprofitability has necessitated annual legislation to finance operating losses. The Congress finally recognized this situation in the Amtrak Improvement Act of 1978, which changed the statutory description of Amtrak as a "for-profit corporation" to read "operated and managed as a for-profit corporation." As such, Amtrak has become increasingly dependent on federal aid. By fiscal year 1981, the funding level for Amtrak had climbed to $936 million, with $719 million for operating grants (accounting for more than half of Amtrak's operating costs), $187 million for capital grants and labor protection payments, and $30 million for loans for capital expenditures. 3/

The growing federal subsidies for Amtrak, the limited amount of transportation service the system provides, and the increasing pressures on the federal budget have prompted efforts to curtail the federal government's financial commitment to Amtrak. The Amtrak Reorganization Act of 1979 established criteria for evaluating individual route performance and

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3. Labor protection costs are those that Amtrak incurs in compensating persons who have lost work because of Amtrak service reductions.

for determining eligibility for federal funding support (see Chapter IV). Additionally, the 1979 act required that Amtrak recover 44 percent of its operating costs from passenger revenues by the end of fiscal year 1982 and half by fiscal year 1985.

More recently, Amtrak's fiscal year 1982 funding level was the focus of considerable Congressional debate. In his March 1981 budget proposal, President Reagan requested a $323 million (35 percent) reduction in Amtrak's subsidy, which would have set federal support for Amtrak at $613 million for fiscal year 1982. This funding request was intended to cover all Amtrak expenses, including operating subsidies, capital costs, interest payments on outstanding debt, and labor protection costs. As part of his September 1981 bid for further budget reductions, President Reagan later requested that only $539 million--another 12 percent less--be appropriated for Amtrak's use in fiscal year 1982. The Congress showed little inclination to endorse the President's proposed cutback for Amtrak, however. Instead, it authorized a funding level substantially higher than either Presidential request--$735 million--while excusing Amtrak from about $82 million in interest payments on outstanding loan obligations and about $14 million in state and local taxes. At the same time, the Congress directed Amtrak to undertake various cost-cutting actions (including reductions for administration, food service, and labor) and required that Amtrak recover half of its operating costs from nonfederal revenues commencing in fiscal year 1982. Amtrak thus emerged relatively unscathed from the fiscal year 1982 budget process, with funding at the equivalent of $831 million--only 11 percent below the peak level of fiscal year 1981.

Nevertheless, the President is once again seeking substantial reductions in Amtrak's budget; he is now requesting a funding level of $600 million to cover most Amtrak expenses in fiscal year 1983. 4/ The President's funding request is 24 percent or $188 million less than the $788 million fiscal year 1983 funding level authorized for Amtrak under the Omnibus Budget Reconciliation Act of 1981. As deliberations on the 1983 budget begin, therefore, the Congress will again face the question of whether subsidies to Amtrak should be reduced.

ISSUES UNDERLYING THE DEBATE ON AMTRAK'S SUBSIDY

In its deliberations about the proper level of federal funding for Amtrak, the Congress will confront several fundamental questions concerning federal involvement in the private market. The justifications that

4. The President's request assumes continued deferral of interest payments on Amtrak's outstanding debt to the Federal Financing Bank.

are generally cited to support governmental intervention in or aid to commercial endeavors tend to fall into two broad categories:

- Those that correct market failures, and
- Those that promote social equity.

Repeated subsidies to Amtrak have been argued on both grounds.

Market Failures

Public financing for certain commercial undertakings may be appropriate when it can improve the performance of the competitive system and overcome a market failure. Such a failure can occur when market prices do not accurately reflect the full societal benefits that a particular good or service may convey. The result can be that the good or service is furnished at a less-than-optimal level. When this occurs, public intervention--in the form of regulation or subsidy, or both--can sometimes either promote an appropriate market response or fill a gap left by a market failure, ultimately bringing about an optimal volume of goods or level of services. Federal intervention in all means of transportation--taking various forms and involving differing degrees of financial commitment--is often justified in these terms. In the particular case of Amtrak (though not exclusive to it), the societal benefits attributed to the system, and in turn to the subsidy, include not only the transportation of riders but also a series of indirect societal benefits that rail passenger service is thought to confer.

Social Equity

Issues of social equity may also justify a federal role in certain commercial activities. The private market cannot assure an equitable distribution of goods or services. Those products that the government judges to be essential to public well-being may not be readily accessible to all portions of the population. In such instances, government may intervene--again, by regulation or subsidy--to assure a distribution that may be more equitable. Government's sizable role in providing education and health care are prime examples of intervention in behalf of social equity; federal aid to transportation, and specifically, to Amtrak, has been cited as another.

PLAN OF THE PAPER

While considering alternative future funding levels for Amtrak in the context of competing budgetary priorities, the Congress must therefore consider several questions:

- What is the public's interest in Amtrak, and does this interest justify continuing federal subsidies?

- What potential is there for alleviating Amtrak's need for federal subsidies without reducing the current network or service levels?

- If cuts in Amtrak services are deemed the only course practicable for reducing subsidy needs, which routes or services should be retained and which eliminated? On what basis can such choices be made?

- What savings could be realized by selected reductions in Amtrak services?

To aid in assessing these issues, Chapter II considers various rationales that have been advanced for Amtrak's federal subsidies. Chapter III reviews the history of federal support for Amtrak and evaluates the prospects for improving the system's financial performance while maintaining service levels. Chapter IV reviews Amtrak's method for identifying costs, revenues, and ridership by route, examines the significance of this method for determining route performance, and summarizes the relative performance of different Amtrak services during fiscal years 1980 and 1981. Chapter V examines the savings that might be realized by selected reductions in Amtrak services.

CHAPTER II. CONSIDERING THE CASE FOR FEDERAL SUBSIDIES TO AMTRAK

When the Amtrak legislation was enacted in 1970, the rationale for federal assistance--thought at the time to be one-time, transitional aid--was not broadly challenged. In part because the subsidy proved to be needed on an ongoing basis, concerns about the size and appropriateness of continued federal support for Amtrak have mounted. The arguments for continuing Amtrak subsidies center around the public benefits conveyed by rail passenger service. Advocates of Amtrak's subsidies contend that a national rail passenger network provides both transportation services and secondary benefits that are essential to public well-being, and therefore, that federal support is warranted.

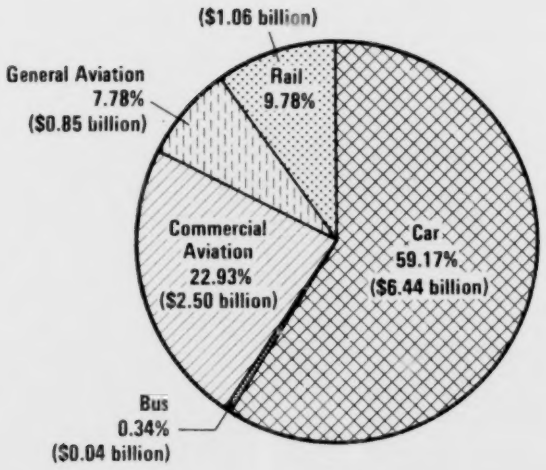
In deliberating future subsidies to Amtrak, the Congress therefore must consider what, if any, aspects of the public interest Amtrak serves. Do federal subsidies enable Amtrak to make essential contributions to the public's well-being? If Amtrak does indeed confer public benefits, does the extent or magnitude of these benefits justify the subsidy costs?

This chapter examines whether Amtrak contributes to public welfare and whether its contribution justifies continued federal subsidies. The discussion focuses on the following six questions:

- Are subsidies to Amtrak necessary to place it on an equal footing with the other transportation modes that receive federal support?
- In terms of energy consumption, how does rail passenger service compare with other modes of intercity passenger transport?
- Does Amtrak offer a viable backup for other transportation modes in the event of emergencies arising from such events as acute oil shortages or work stoppages?
- Is Amtrak an important part of the nation's defense transportation network?
- Does Amtrak contribute significantly to the mobility of low-income Americans?
- Does Amtrak offer unique benefits in preserving a historic link with the nation's past and in providing recreation?

Figure 1.

Comparison of Intercity Passenger Modes, by Gross Federal Outlays, Net Federal Outlays, and Market Share (Fiscal Year 1980)



SOURCE: Congressional Budget Office.

NOTE: "Car" category includes autos motor cycles, pickups, and vans excludes buses.

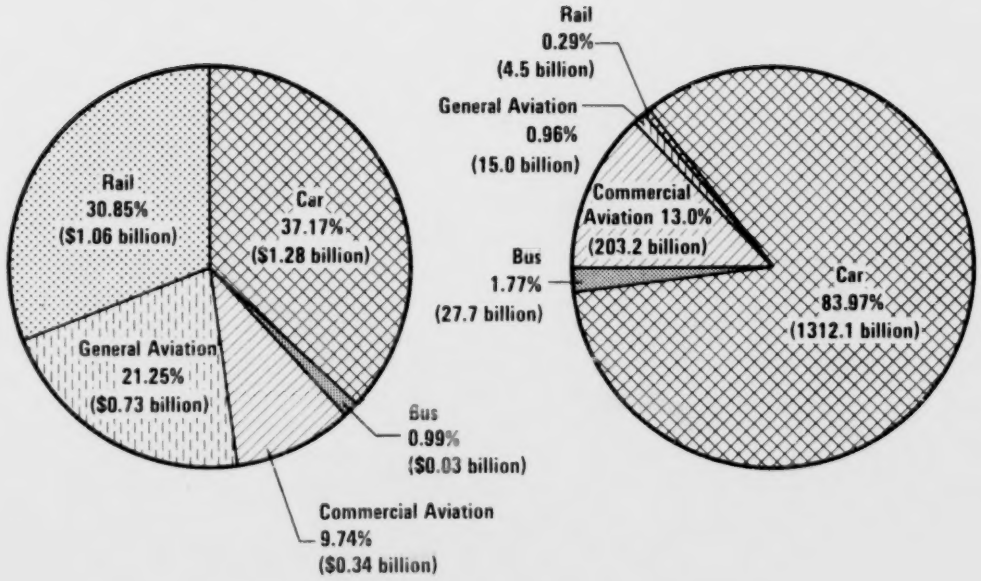
CONSIDERATIONS OF EQUITY WITH OTHER MODES

One argument for Amtrak subsidies is simply that they put rail passenger service on an equal footing with its competition. All modes of passenger transportation, including highways, air, urban mass transit, and railroads, receive some amount of federal subsidy. Rail passenger service receives exceptionally large federal subsidies, however, relative to the traffic volume carried. Moreover, the federal government pays a large share of the overall costs of rail passenger service. Figure 1 displays the distribution of federal outlays for intercity passenger transportation among the various modes before and after income from user charges are taken into account and also shows the distribution of intercity passenger miles carried.

In fiscal year 1980, outlays in the transportation function of the federal budget (function 400) totaled an estimated $21.1 billion. Of this sum, about $14.2 billion went to passenger transport--$10.9 billion for intercity passenger travel and $3.3 billion for local mass transit. Motor vehicles (including cars, motorcycles, pick-ups, and vans) accounted for the bulk of the outlays for intercity passenger travel--$6.44 billion (59 percent), while outlays for bus totaled about $0.04 billion or less than 1 percent.

Distribution of Net Outlays
After User Fee Offsets

Distribution of Total
Passenger Miles Carried



Outlays for air passenger travel accounted for $3.35 billion (31 percent) with $2.5 billion (23 percent) going to commercial aviation and $0.85 billion (8 percent) to general aviation. Outlays for rail passenger service, including subsidies for Amtrak and for the Northeast Corridor Improvement project, accounted for a relatively small proportion of gross federal expenditures for intercity passenger travel--$1.06 billion (10 percent). 1/

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1. As Amtrak's most heavily traveled network, the Northeast Corridor was designated to undergo major improvements beginning in 1976. The improvement project involves installing welded rails, replacing ties, realigning curves, rebuilding the tunnels through New York City and Baltimore, replacing or modifying bridges, modifying the existing electrification between Washington, D.C. and New Haven, and extending the electrification from New Haven to Boston. The project, administered by the U. S. Department of Transportation, is scheduled for completion in the late 1980s, although budgetary constraints may necessitate postponement or cancellation of specific tasks, including electrification north of New Haven.

Accounting for User Charges

These gross outlay or expenditure figures do not, however, take account of offsetting revenues to the federal government from the various charges levied on transportation users. A large portion of these outlays are financed through excise tax revenues from the users of different transport services or modes. For example, about 80 percent of the $6.48 billion expended in fiscal year 1980 for highway passenger programs (both for car and bus travel) was financed through user fees paid into the Highway Trust Fund. The federal subsidy to intercity highway passengers therefore totaled only $1.31 billion in fiscal year 1980--$1.28 billion for cars and $0.03 billion for buses. Similarly, 68 percent of the $3.35 billion in federal expenditures for air transportation was financed from the Airport and Airways Trust Fund (including revenues from user taxes on aviation fuel and passenger tickets), leaving a federal subsidy of $1.07 billion--$0.73 billion for general aviation and $0.34 billion for commercial aviation.

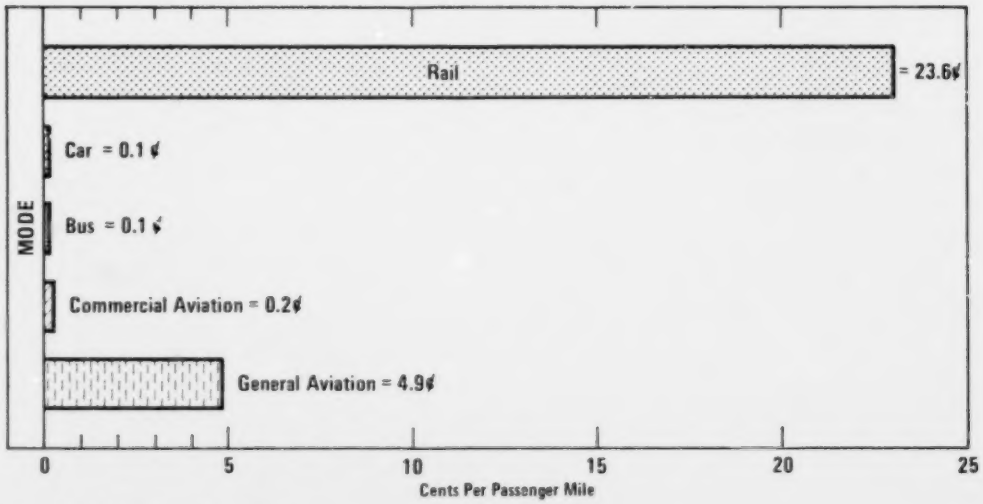
When user charges are taken into account, net federal expenditures or subsidies for intercity passenger transportation totaled $3.44 billion in fiscal year 1980. (Subsidies to local mass transit accounted for an additional $3.3 billion.) Subsidies to intercity rail passenger travel (including support for Amtrak and the Northeast Corridor project) accounted for 31 percent of this $3.44 billion in net federal expenditures. Highways accounted for 38 percent (37 percent for cars and 1 percent for buses) of subsidies to intercity passenger travel. Air accounted for 31 percent (21 percent for general aviation and 10 percent for commercial aviation).

Federal Subsidy Per Passenger Mile

Rail's share of net federal expenditures (or subsidies) for intercity passenger transportation are roughly comparable to the shares received by the highways and airways. Nevertheless, rail carries a very small proportion of all intercity passenger traffic--less than 1 percent. Thus, expressed as aid per passenger mile, the rail passenger subsidy is much higher than for any other intercity passenger mode. For each passenger mile traveled on rail in fiscal year 1980, the federal government spent an average of 23.6 cents. 2/ In contrast, the federal government spent 4.9 cents per passenger mile for general aviation, while commercial aviation received 0.2 cents per passenger mile. Highway users, whether in cars or buses, received 0.1 cents per passenger mile (see Figure 2). Details of these subsidy calculations are presented in Appendix A.

Figure 2.

Federal Transportation Subsidies Per Passenger Mile
Net of Revenues from User Fees, by Mode (Fiscal Year 1980)



SOURCE: Congressional Budget Office.
NOTE: "Car" category includes autos, motorcycles, pickups, and vans; excludes buses.

Federal Subsidy as a Proportion of Total Costs

Federal subsidies for rail passenger service also fund an exceptionally large portion of the total costs of rail passenger service. In fiscal year 1978, the federal government paid 71 percent of the total amount spent for rail passenger service, including revenues from passengers' tickets as well as all government subsidies. The federal government spent $2.50 for each $1.00 collected in fares or state and local subsidies for rail passenger service. By comparison, for each $1.00 that motorists or air travelers spent, the federal government spent 0.2 cents and 5.0 cents, respectively.

ENERGY EFFICIENCY CONSIDERATIONS

Amtrak's potential contribution to the nation's energy conservation efforts has received a great deal of attention in recent years, giving rise to a number of questions. Specifically, how does rail service currently compare with other modes of intercity passenger transport in the amount of energy consumed? And how might improved rail equipment and better use of this equipment affect Amtrak's relative performance in future years? The answers to these questions depend not only on rail's technological

characteristics but also on the performance of the other modes that passengers would use if rail passenger service were not available.

Total Energy Consumption

From a technological standpoint, bus is the most energy-efficient mode, air is the least efficient, and rail ranks better than the automobile in the Northeast Corridor but worse elsewhere because of less efficient train configurations. (For example, many trains outside the Northeast Corridor include baggage cars, diner cars, and sleeper cars in addition to normal coach cars; such low-capacity cars lessen the energy efficiency of train operations.) Since rail travel is much more energy efficient than air, energy is saved when a passenger chooses rail over air. In the Northeast Corridor, some 5,144 British thermal units (BTUs) of energy are saved for each passenger mile diverted from air to rail. On the other hand, energy is lost when travelers are attracted from bus to rail. Such losses can be substantial, averaging 3,999 BTUs per passenger mile diverted outside the Northeast Corridor. 3/

Taking into account the energy efficiency of the modes that would be used if Amtrak were not available, 4/ rail saves an average of 544 BTUs per passenger mile in the Northeast Corridor, but it loses 1,267 BTUs per passenger mile elsewhere. The average trip along the corridor in 1980 therefore saved 54,400 BTUs, or almost three and a half pints of gasoline, while the average trip outside the Northeast Corridor lost 424,965 BTUs or approximately three and a half gallons of gasoline. 5/ The poorer performance of Amtrak outside the Northeast Corridor is attributable to more circuitous routes and less efficient train configurations, as noted above.

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3. For a detailed analysis of Amtrak's energy efficiency, see CBO, "The Current and Future Savings of Energy Attributable to Amtrak" (May 1979).

4. Based on Amtrak Passenger Assessment Survey of February 1979. This survey found that, if Amtrak service were not available, 48 percent of Amtrak's passengers on the Northeast Corridor would use cars, about 32 percent buses, 16 percent planes, and the remaining 4 percent would not travel. On Amtrak's non-Northeast Corridor routes, 46 percent of the passengers reported that they would otherwise take cars, 25 percent buses, 24 percent planes, and about 6 percent would not travel.

5. One gallon of gasoline yields 125,000 BTUs of energy.

Improvements in the energy efficiency of rail (as well as of other transportation modes) are virtually certain, in light of expected improvements in load factors and technology. Future Amtrak operations in the Northeast Corridor could therefore yield larger energy savings than they have to date--savings of 1,162 BTUs per passenger mile diverted to rail. Nonetheless, even assuming substantial improvements in technology and load factors, Amtrak will continue to be relatively inefficient in its use of energy outside the Northeast Corridor, although the losses will not be so large as those experienced in the past--decreasing by slightly more than one-half, to losses of 537 BTUs per passenger mile diverted to rail. Thus, even with future improvements in Amtrak's operating efficiency, the Northeast Corridor rail service will yield only limited energy savings, while the rest of the system will incur an energy loss. The rail passenger system as a whole will yield a net energy loss.

Petroleum Consumption

The above estimates reflect the total energy requirements of each mode, including oil-, coal-, and nuclear-derived energy. Of particular concern, however, is petroleum-based energy consumption. Most intercity transportation modes depend largely on petroleum. The notable exception is rail service in the Northeast Corridor.

About half of all rail propulsion energy on the Northeast Corridor is currently derived from electricity generated by coal-fired or nuclear power plants. Amtrak's current rail service in the Northeast Corridor thus saves more than 1,800 BTUs of petroleum per passenger mile, assuming that the energy required for vehicle manufacture is not petroleum based.

In the future, the proportion of non-petroleum-based propulsion energy for rail service along the Northeast Corridor could increase. If the Northeast Corridor Improvement Project is completed, rail service along the Northeast Corridor will be entirely electrically powered. Assuming that about 29 percent of the Northeast's electric power will be generated by petroleum, 71 percent of rail propulsion energy in the Northeast Corridor would thus come from other sources. Amtrak's Northeast Corridor operations would therefore save about 1,773 barrels of oil per day. 6/

In summary, Amtrak appears to be, and will continue to be, an energy loser outside the Northeast Corridor, while saving a limited amount of

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6. This estimate is based on improved technological efficiency and load factor assumptions.

energy within the corridor. Even under very optimistic assumptions regarding future improvements in Amtrak's technological fuel efficiency, load factors, and traffic volumes, however, Amtrak's Northeast Corridor operations will yield total energy savings of only 873 barrels of petroleum-equivalent per day, or petroleum-only savings of 1,773 barrels per day. These savings represent less than one one-hundredth of one percent of the nation's daily consumption of petroleum. 7/

The federal government pays substantial sums to achieve these relatively small energy savings. In fiscal year 1980, the Northeast Corridor trains accounted for $126 million of Amtrak's fully allocated operating loss. 8/ Assuming that future energy reductions associated with Amtrak's Northeast Corridor operations had been realized in 1980, the cost to the federal government would have been $395 per barrel (petroleum equivalent) of energy saved. Oil savings would have cost an estimated $195 per barrel, compared with a world market price of about $31 per barrel in 1980. Moreover, these estimates understate the total costs of oil savings associated with Amtrak's Northeast Corridor operations. The capital costs--specifically, the cost of improving and electrifying the corridor and of upgrading and converting rolling stock--are not taken into account. 9/

In comparison, other potential sources of future energy savings cost significantly less. For example, each barrel of oil saved through improved automotive fuel economy costs an estimated $20. 10/ Similarly, by some

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7. A few other corridor operations (specifically, near Chicago and Los Angeles) could potentially result in some limited energy savings as well. These savings would probably be significantly less than on the Northeast Corridor, however, because of different equipment, operating conditions, and competing modes. And since the energy consumed by trains outside the Northeast Corridor is estimated in aggregate, if some corridors outside the Northeast do yield a net energy savings, then the energy losses associated with the remaining non-Northeast Corridor operations are even greater than estimated in this paper.

8. This figure only accounts for estimated federal subsidies to those trains classified as Northeast Corridor trains.

9. Current estimates put the total cost of electrifying the Northeast Corridor at almost $400 million, including $310 million for electrification of the New Haven to Boston segments. (Only $56 million of this total has been spent to date.) Moreover, additional costs will be incurred as Amtrak electrifies its rolling stock. Amtrak has already contracted for 47 electric locomotives to be used on the Northeast Corridor at a cost of about $3 to $4 million each.

10. See CBO, Fuel Economy Standards for New Passenger Cars After 1985 (December 1980).

estimates, synthetic fuels production would cost between $27 and $98 per barrel of oil equivalent. 11/ Moreover, each of these alternatives has the potential for very significant reductions in oil consumption over time. Thus, though some parts of the Amtrak system help save some energy, these savings are small and the associated costs high.

TRANSPORTATION EMERGENCIES

Amtrak's subsidies are also defended as providing the nation with an alternate transportation system to serve as insurance against transportation service disruptions arising from various emergencies. Amtrak's potential contributions in two possible emergency situations--an acute oil shortage, and a reduction in service by other passenger carriers--are reviewed below.

In the Event of Oil Shortages

Future disruptions in foreign oil supplies are an ever-present threat. As before, another acute oil shortage would severely restrict air and car travel (generally the two most energy-consuming modes), and the burden of meeting the nation's transportation needs would shift to bus and rail. Under such circumstances, Amtrak's contribution could be two-fold: to provide an energy-efficient means of transportation and thereby dampen the adverse effects of a shortfall in oil supplies, and to fill the transportation gap left by the disruption of automobile and air service.

Amtrak's contribution in the event of an oil shortage would be limited. As discussed in the previous section, Amtrak's potential to conserve oil is minimal. At most, Amtrak could save up to 1,886 barrels of petroleum per day or 688,390 barrels per year--less than 0.02 percent of current consumption levels. 12/ These savings would thus do little to offset a significant shortfall in oil supplies, particularly in comparison to other measures such as filling the Strategic Petroleum Reserve. For example, a reserve of 750 million barrels would offset the effects of a year-long national oil shortfall of 2 million barrels a day. Recognizing the benefits of such a reserve, the Congress (under the Omnibus Budget Reconciliation Act of

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11. See Richard H. Shackson and J. James Leach, Maintaining Automotive Mobility: Using Fuel Economy and Synthetic Fuels to Compete with OPEC Oil, Energy Productivity Center, Mellon Institute (August 18, 1980).

12. This estimate derives from the relatively optimistic assumption of average load factors of 75 percent--substantially higher than load factors experienced during the 1973 OPEC oil embargo and the 1979-1980 Iranian crisis.

1981) set a goal to fill the reserve at a rate of 110 million barrels annually. The Administration now plans, however, to acquire only 76 million barrels of oil for the reserve in fiscal year 1983. Current limitations on storage capacity constrain oil purchases to this rate. If, however, federal subsidies to Amtrak were diverted to purchase oil and temporarily to lease above-ground storage facilities (most of the reserve is now held in subterranean salt domes), some 20 to 25 million additional barrels of oil could be acquired in fiscal year 1983. This would increase the reserve by about 10 percent over its current 250 million barrel level and would bring the fill rate close to the goal set by the Congress.

Moreover, Amtrak's capacity to provide mobility to the nation during an acute oil shortage would be restricted by the system's limited service network. Whereas certified air carriers provide scheduled service to some 628 points (not including points served by scheduled commuter air carriers), intercity bus serves 50,000 points, and cars are virtually ubiquitous, Amtrak serves only 495 points nationwide. In addition, Amtrak's carrying capacity is very limited. In fiscal year 1980, Amtrak had the capacity to carry about 9.5 billion passenger miles. Even assuming the average load factor--the average fraction of all seats occupied--had climbed to 75 percent (instead of the actual 48 percent loads realized in that year), Amtrak would have provided only 7.1 billion passenger miles of service nationwide or less than one percent of total U.S. intercity passenger travel. Moreover, a system-wide average load factor of 75 percent is very unlikely, judging from Amtrak's experience during the 1973 OPEC embargo and the 1979-1980 crisis. Load factors of about 75 percent have been achieved only on a few Amtrak routes and then, only during the peak summer travel season.

In the Event of Service Reductions by Other Passenger Carriers

National transportation emergencies could also arise in a situation such as a labor strike against another passenger carrier. Common carriers (carriers that transport people for compensation) currently account for about 15 percent of total U.S. intercity passenger travel. In terms of passenger miles traveled, the airline industry dominates the common carrier market, carrying 86 percent of all intercity passenger miles traveled by common carrier. Buses carry about 12 percent of intercity travel by common carriers. Rail accounts for the remaining 2 percent.

Substantial reductions in either airline on bus service could increase demand for Amtrak service, but probably not significantly. If the demand displaced by interrupted air or bus service were allocated among other modes in proportion to their current market shares, Amtrak ridership would not increase appreciably. Passenger cars, which already account for a full

84 percent of all intercity travel, would probably take up most of the slack left by a common carrier disruption. The experience of shifted demand that emerged during the 1981 strike of air traffic controllers tends to bear out this supposition; Amtrak gained almost no ridership during that episode.

Even with substantially increased demand for common carrier service, however, Amtrak's role would be restricted by its limited network and passenger capacity. Amtrak would be able to meet only about 4 percent of the total demand for intercity common carrier service (assuming no shift to cars and Amtrak trains loaded to capacity, neither of which is a likely prospect). The majority of the affected passengers therefore could not travel by Amtrak even if they chose to do so.

NATIONAL SECURITY

Amtrak has been cited as an important element of a national defense transportation network, and federal subsidies to Amtrak have been advocated on these grounds. This argument draws on the experience of World War II, when railroads played a critical role in mobilizing U.S. defenses. At that time, there was no interstate highway network, and the nation's air transportation system was very small. Partly in response to the World War II experience, however, the federal government has invested billions of dollars over the past three decades to develop the National System of Interstate and Defense Highways. 13/ At the same time, a complex nationwide air transport network has evolved. Thus, with highways and air transport available to meet military needs in the event of a confrontation involving the United States, the defensive role that railroads would have to play is probably much diminished. Moreover, what role they could play depends on track and roadbed being of a suitable quality.

Accordingly, some advocates of Amtrak's subsidy point to it as a means of maintaining track and roadbed that could serve defense purposes. In fact, however, Amtrak operations have very limited effect on the quality of track and roadbed. Though passenger operations require comparatively good track and roadbed, the degree of maintenance (hence quality) usually more nearly reflects the importance of a given track segment to normal (civilian) freight operation. In general, Amtrak has selected it routings to reflect the constraints imposed by the existing quality of track and roadbed. To the extent that rail passenger service operations do result in facility improvements, the nature of these improvements are generally such that

13. See CBO, Highway Assistance Programs: A Historical Perspective (February 1978).

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non-passenger operations (such as the movement of strategic materiels and equipment) would not benefit directly. For example, much of the facility-related improvements for Amtrak operations outside the Northeast Corridor include such things as improved signalling and communications systems and automated switches. While these improvements may be very important to rail passenger service, ensuring safe operation and reduced travel times, they are much less important for freight operations and have only marginal impact on the transportation system's capacity to haul troops, supplies, equipment, and freight during a military emergency. Moreover, about one-third of the corridors identified by the Military Traffic Management Command as strategic rail corridors (linking military installations and manufacturing plants) are on low-volume branchlines. Such low-volume branches are virtually unaffected by Amtrak's operations. Amtrak's subsidy therefore does not serve to improve the rail system's military usefulness.

TRAVEL BY LOW-INCOME PEOPLE

Some proponents of federal subsidies to Amtrak justify them as a means of providing transportation for low-income Americans, for whom air or car travel are too expensive. In general, though, transportation subsidies tend to benefit higher-income persons more than low-income persons, because the poor travel less. Travel by low-income persons is less than proportional to their share of the U.S. population as a whole. Whereas 12 percent of the population had family incomes of less than $5,000 in 1977, only 7 percent of trips in that year were made by persons with family incomes of less than $5,000. 14/

Transportation modes differ, however, according to which income groups they serve (see Table 1). Air travel serves persons with higher average incomes--fully 60 percent of the trips carried by air in 1977 were persons with family incomes of $20,000 or more, while only 36 percent of the U.S. population had family incomes in that range. Bus, on the other hand, serves more low-income persons--17 percent of the trips carried by bus in 1977 were made by the 12 percent of the population with family incomes under $5,000. An on-board survey conducted in August of 1976 by Greyhound Corporation found similar results--that low-income persons accounted for a disproportionate share of bus riders. 15/ Greyhound found

14. The most recently available travel data are for 1977.

15. See Greyhound Corporation, "Greyhound On-Board Passenger Survey" (August 1976).

TABLE 1. INCOME DISTRIBUTION OF TOTAL POPULATION AND TRAVELERS, BY MODE OF TRANSPORTATION (Calendar year 1977)

Family Income (In dollars)	Percent of U.S. Population	Percent of All Person Trips Taken				
		Train	Bus	Air	Auto	Total
Under 5,000	12	7	17	5	6	7
5,000 to 9,999	18	13	19	9	13	12
10,000 to 14,999	18	14	21	13	21	20
15,000 to 19,999	17	13	14	13	19	18
Over 20,000	36	53	28	60	41	43
Total	100	100	100	100	100	100

SOURCES: U.S. Department of Commerce, Bureau of the Census, Money Income in 1977 of Families and Persons in the United States (Series P-60, No. 118, March 1979); and 1977 National Travel Survey Data unpublished cross tabulations.

NOTE: Details may not add to totals because of rounding.

that fully 65 percent of its bus passengers had family incomes below $15,000, while only 51 percent of all persons in the United States had family incomes below $15,000 in 1976. The median income of car travelers is generally lower than that of air travelers but higher than that of bus riders.

Similarly, train travelers have higher median incomes than the population at large. In 1977, 7 percent of all train trips were made by people with incomes of less than $5,000--less than the 12 percent share of the population that was held by this income group. Persons with family incomes over $15,000 accounted for 66 percent of the person trips carried by trains in 1977--greater than their share of the population at large.

In short, subsidies to Amtrak generally aid higher-income groups as do subsidies for the air and auto modes. If transportation subsidies are to be channeled specifically toward low-income people, aiding intercity bus service would be more effective than aid to Amtrak. Taking a different approach, the goal of ensuring that transportation services be available to low-income people could be more efficiently addressed if aid went directly to individuals rather than to transportation modes, which would facilitate individuals' choices between modes.

HISTORIC AND RECREATIONAL VALUE

Finally, subsidies to Amtrak are also argued on the basis of historic and recreational value. The value attached to railroads is emblematic of the role they played in the country's original expansion and settlement. The decline of rail passenger service in the United States has been lamented as a break with the nation's heritage. Rail travel is also prized for the views it affords to current-day travelers.

Amtrak's historic value is captured by numerous routes. The San Francisco Zephyr, from Chicago to San Francisco, holds particular appeal for history enthusiasts, since it traverses part of the route followed by the Union Pacific's transcontinental railroad chartered in 1867. The Broadway Limited, from Chicago to New York City, traverses the Horseshoe Curve (west of Altoona, Pennsylvania) constructed in 1852 and known as one of the great wonders of railroad building. And the tough and demanding Arizona terrain crossed by the Southwest Limited, from Chicago to Los Angeles, vividly illustrates the conditions that led the Santa Fe to pioneer in the use of diesel locomotives in 1941. Additionally, Amtrak routes serve historic sites such as the Revolutionary War battlegounds of Fort Ticonderoga and Fort Edwards in upstate New York and the Civil War fields near Fredericksburg, Virginia.

Many of Amtrak's routes are celebrated for their views. The San Francisco Zephyr offers a scenic trip through the Great Plains, the Rockies, the Sierra Nevada, and the San Francisco Bay area. The Southwest Limited also runs through scenic areas as it crosses the Continental Divide in New Mexico. Likewise, the Empire Builder from Chicago to Seattle provides a view of the prairies and mountains of the west. The San Diegan (from Los Angeles to San Diego) is another route known for its panoramas as it skirts the Pacific coast and passes through the Soledad Canyon.

Rail passenger service--synonymous with Amtrak--certainly offers recreational benefits and stands as a historical link with the nation's past. Though of definite value to American life, one can reasonably ask whether these benefits justify large and continuing federal subsidies. In any case, such historic and recreational assets do not lend themselves to being numerically quantified or analytically assessed.

CONCLUSIONS

Amtrak's contributions to these broad societal goals appear to be quite limited. Many of these benefits or goals might be obtained more effectively through other programs. For example, the Strategic Petroleum Reserve

appears to be a far more economical way to invest in energy security. Similarly, subsidies to intercity buses would help more low-income people than do subsidies to Amtrak. To the extent that the benefits conveyed by Amtrak are limited and could be achieved more effectively through other policies, federal subsidies to Amtrak become more difficult to justify.

The Amtrak system may therefore be appropriately evaluated on the basis of its financial performance. The design of the Amtrak network, like any other transportation system, could be determined chiefly by the financial performance of its various services. In this context, it is helpful to explore whether any major shifts can be anticipated that will significantly change Amtrak's financial future. The following chapter reviews the outlook for the current Amtrak system and examines the prospects for diminishing its future subsidy requirements through both cost reductions and revenue increases.

CHAPTER III. PROSPECTS FOR REDUCING AMTRAK'S SUBSIDY NEEDS

Concern over sizable federal subsidies for Amtrak comes at a time when many of Amtrak's proponents argue the system is turning the corner to becoming an efficient, self-supporting part of the national transportation network. In many respects, U.S. rail passenger service under Amtrak's management has indeed improved markedly. More people are riding Amtrak trains--about 4 million more passengers used Amtrak in 1981 than in 1972. Amtrak has much newer equipment today than it did in 1972: the average vintage of Amtrak's rolling stock has dropped from 23 years of age to about four years. Moreover, Amtrak service has become more reliable--on-time performance has improved dramatically.

Despite improved ridership and service, however, Amtrak continues to lose substantial amounts of money. Amtrak required $755.5 million in federal operating subsidies during fiscal year 1981 in addition to $217 million in capital grants and loans. 1/ Furthermore, Amtrak's subsidy, prorated per passenger mile, still far exceeds the federal subsidies going to other modes of travel.

This chapter evaluates the prospects for improving Amtrak's financial performance and reducing its future subsidy needs. It begins by reviewing Amtrak's experience to date and examining future subsidy needs in light of current operating practices. The second section reviews Amtrak's cost structure and examines the potential for future reductions. The third section examines Amtrak's revenues and evaluates the prospects for increased future revenues through both higher fares and improved ridership. The final section summarizes the implications of Amtrak's financial structure for future federal subsidy requirements.

AMTRAK'S PAST AND PROJECTED SUBSIDY NEEDS

Despite original Congressional intent to form a self-supporting corporation, Amtrak has never covered its costs with passenger revenues and has become increasingly dependent on federal assistance. This federal

1. The $755.5 million in federal operating subsidies for fiscal year 1981 includes about $25.5 million in carryover from previous fiscal years and $9.8 million from reserves.

TABLE 2. FEDERAL BUDGET AUTHORITY FOR RAIL PASSENGER SERVICE (Fiscal years 1971-1981, in millions of current dollars)

Year	Amtrak Operating Grants	Amtrak Capital		Northeast Corridor Purchase	Northeast Corridor Improvement Program	Total Federal Assistance
		Loans	Grants			
1971 a/	40.0	100.0	---	---	---	140.0
1972	170.0	50.0	---	---	---	220.0
1973	0	50.0	---	---	---	50.0
1974	146.6	300.0	2.5	---	---	449.1
1975	276.5	400.0	---	---	---	676.5
1976 b/	462.0	---	139.2	---	50.0	651.2
1977	482.6	---	93.1	25.0	200.0	800.7
1978	536.0	---	130.0	25.0	400.0	1,091.0
1979	600.0	---	130.0	24.0	490.0	1,244.0
1980	650.4	---	201.0	12.0	381.0	1,244.4
1981	719.2	30.0	187.1	---	350.0	1,286.3
Total	4,083.3	930.0	882.9	86.0	1,871.0	7,853.2

SOURCE: U.S. Department of Transportation, Federal Railroad Administration (April 1982).

a. Initial funding.

b. Includes transition quarter.

assistance has comprised cash appropriations to fund operating deficits and labor protection costs as well as a mixture of loans and grants to meet capital needs (see Table 2).

Amtrak's subsidies have increased considerably during its ten-year existence. Annual federal support (excluding funding for the Northeast Corridor purchase and improvements) increased more than six-fold since Amtrak's inception, from $140 million in fiscal year 1971 to $936 million in fiscal year 1981--an increase of 232 percent after inflation. Operating grants accounted for the bulk of this funding growth, having increased by $679 million during this period. By 1981, federal subsidies made up about 60 percent of Amtrak's operating costs (less depreciation), with subsidies averaging about $37 per passenger.

Amtrak's subsidy needs, under standard operating procedures, would continue to grow in future years even with no increase in services. Assuming that the route network remained as it was in fiscal year 1981, Amtrak would require total federal subsidies in the range of $1.13 billion during fiscal year 1983--$925 million for operations (including operating subsidies, interest payments on outstanding loans, and state and local taxes), $200 million for capital (assuming roughly the same capital funding level as fiscal year 1981), and $5 million for labor protection payments. This subsidy estimate assumes that Amtrak would fail to realize very substantial cost reductions or revenue increases--that is, beyond past experience--during the next several years.

Clearly, this assumption is pessimistic--Amtrak could indeed realize some cost reductions or revenue increases over the next few years. For example, Amtrak estimated that it would realize $30 million in cost savings during fiscal year 1982 for on-board food and beverage service. Similarly, Amtrak planned to achieve significant savings from cost reductions in maintenance, marketing, management, and other areas. To this end, Amtrak recently announced wage settlements with six unions, which Amtrak estimates could save more than $132 million over the next three years. Amtrak is also projecting substantial ridership improvements. The real issue, however, is whether Amtrak can realize cost savings or revenue increases sufficient to affect its subsidy needs significantly. The following pages therefore review Amtrak's cost and revenue structure.

AMTRAK'S COST STRUCTURE--PAST EXPERIENCE AND FUTURE PROSPECTS

Amtrak's cost increases over the last decade have far out-paced its revenue gains. Between fiscal years 1972 and 1980, operating costs increased by 112 percent (after inflation). Part of this cost increase stemmed from an expanded route system and improved service--the number of Amtrak train miles increased by about 15 percent, while ridership increased by 28 percent, and passenger miles by 50 percent. This growth in service and patronage undoubtedly accounted for some of Amtrak's cost growth. Nonetheless, Amtrak's real costs per train mile more than doubled, while costs per passenger rose by more than 80 percent and costs per passenger mile by 40 percent.

By fiscal year 1980, Amtrak's operating expenses totaled $1.15 billion including $58 million in depreciation and $31 million in interest on outstanding loans). The three major components were:

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- Direct operating costs of the trains themselves, including engine and other on-board crews, fuel and power, and payments for rented equipment (25 percent of total expenses);

- Maintenance of rolling stock, including inspection and servicing, heavy repairs, running maintenance, and trip cleaning (28 percent of total expenses); and

- Corporate overhead, including advertising, marketing, sales, reservations, procurement, and computer support systems (14 percent of total expenses).

Other major cost elements included maintenance of track, roadway, and facilities (at 8 percent), transportation operations such as train dispatching, signalling, and yard operations (at 4 percent), taxes and insurance (at 3 percent), interest on outstanding loans (at 3 percent), and depreciation (at 5 percent).

Amtrak's operating costs are high relative to the volumes of traffic carried. In fiscal year 1980, Amtrak's costs averaged $54 per passenger carried and 25 cents per passenger mile carried. Moreover, Amtrak's operating costs are high relative to those of intercity buses and airlines (see Table 3). Though Amtrak's total costs in 1980 were less than either the buses' or airlines'--$1.15 billion, compared with $1.31 billion for the bus industry and $25.75 billion for the airline industry--Amtrak's traffic volume was also substantially less. 2/ Amtrak's total operating costs in 1980 were only 12 percent less than the bus industry's, but Amtrak carried 84 percent fewer passengers and logged 74 percent fewer passenger miles. Similarly, the airlines carried more than 45 times the number of Amtrak's passenger miles but had total operating costs only 22 times those of Amtrak.

In 1980, Amtrak's cost per passenger was $54.25--in contrast to $9.76 for buses and $91.67 for airlines. This difference reflected, in part, the variety in average trip lengths among modes: Amtrak trips averaged 216 miles in 1980, compared with bus travel's 129 miles and air travel's 739 miles. Amtrak thus provides more service miles per passenger than the bus industry but less than the airline industry. Amtrak's cost per passenger should therefore be greater than that of bus but less than the airline's.

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2. Data are based on calendar year information for bus and airline and fiscal year for Amtrak. Bus costs include only those for Class I bus carriers--bus companies (numbering about 45 or 50) with annual revenues above $3 million. Airline data are for domestic routes of certificated carriers.

TABLE 3. COMPARISON OF OPERATING EXPENSES OF INTERCITY COMMON CARRIER MODES (Calendar year 1980 for bus and airline and fiscal year 1980 for Amtrak)

Mode	Total Operating Costs (In billions of dollars)	Passengers (In millions)	Passenger Miles (In billions)	Costs (In dollars) Per Passenger	Costs (In dollars) Per Passenger Mile
Amtrak	1.15	21.2	4.56	54.25	0.25
Bus	1.31	134.2	17.30	9.76	0.08
Airline	25.75	280.9	207.62	91.67	0.12

SOURCES: National Railroad Passenger Corporation, Route by Route Profit and Loss, Cost and Ridership Criteria Data for the Year Ended September 30, 1981 (February 12, 1982). Civil Aeronautics Board, Air Carrier Traffic Statistics; Month of and 12 Months Ended September 30, 1981 (September 1981). American Bus Association, Bus Facts: Intercity Bus Industry in 1980 and Decade of 1970s (1981 Edition).

A better comparison of the three modes' costs might be made on the basis of costs per passenger mile. This measure adjusts costs to reflect the actual level of transportation service--measured in passenger miles--each mode provides. Amtrak's cost per passenger mile averaged 25 cents in 1980, compared with 8 cents for buses and 12 cents for airlines'. Again, however, some of this variation in costs is the result of different average trip lengths carried. The total cost of long trips can be expected to exceed that for short trips. The cost per mile, however, should decline as trip length increases, since costs that do not vary with trip length--such as ticketing, station, and terminal costs--are spread over longer trips. Thus, though direct operating costs should increase proportionally with trip length, these so-called fixed costs do not. The average costs per passenger mile should therefore decline as trip length increases.

Since Amtrak's 216-mile average trip length is greater than buses' 129 miles but less than airlines' 739 miles, Amtrak's cost per passenger mile should be less than bus's but greater than air's. In fact, however, Amtrak's costs per passenger mile are about three times those of bus and twice those of air. Amtrak thus appears to suffer a real cost disadvantage (apart from

varying trip lengths) with respect to the bus industry. Moreover, though Amtrak's high per-passenger-mile costs relative to air's may be attributable partly to shorter average trip lengths on Amtrak, the variation in trip length does not appear to account for a significant portion of this cost difference. Notably, according to Amtrak's estimates, costs per passenger mile on Amtrak's long-distance routes--with an average trip length of 502 miles--was 24 cents in fiscal year 1980. Similarly, in fiscal year 1981, Amtrak's long-distance routes carried an average trip of 634 miles at a cost of 24 cents per passenger mile. Thus, Amtrak's per-passenger-mile costs on routes that carry longer trips are still significantly higher than those of the airlines.

Amtrak's relatively high costs per passenger mile are generally attributed to the interaction of three characteristics: low load factors, high labor costs, and high capital intensiveness None of these factors is unique to Amtrak. Airline service, for example, is extremely capital intensive; buses operate with load factors comparable to Amtrak's. Both of these modes are able to counterbalance these factors, however: airlines, with high load factors and intense use of equipment; buses, with relatively low capital and labor costs. The nature of rail passenger service, however, makes it difficult for Amtrak to offset or counterbalance the adverse effects of such factors. The following sections review each of these factors and assesses their potential to contribute to future reductions in Amtrak's costs per passenger mile.

Load Factors

Low load factors have been held partly responsible for Amtrak's financial difficulties. 3/ In fact, Amtrak's average load factor in fiscal year 1980 was 48 percent--the same as on buses (see Table 4). The airlines have an average load factor of 58 percent.

Higher load factors could reduce Amtrak's average cost per trip, but Amtrak's costs per passenger mile would still exceed those of the airline and bus industries. Even if Amtrak's average load factor were to increase dramatically to 75 percent, Amtrak's operating cost per passenger mile would still exceed that of bus and air, and it would have only a marginal effect on Amtrak's need for federal subsidy support. This is reflected in

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3. Load factor is the average proportion of all available seats actually occupied by passengers. The systemwide load factor is computed as the total number of passenger miles carried divided by the number of seat miles operated on the system.

TABLE 4. COMPARISON OF EXPENSES PER SEAT MILE BY COMMON CARRIER INTERCITY MODE (Calendar year 1980 for bus and airline and fiscal year 1980 for Amtrak)

Mode	Total Operating Costs (In billions of dollars)	Average Load Factor (Percent)	Seat Miles (In billions)	Costs per Seat Mile (In dollars)
Amtrak	1.15	48	9.51	0.12
Bus	1.31	48	35.81 a/	0.04
Air	25.75	58	355.30	0.08

SOURCES: See Table 3.

a. Assumes the average intercity bus has a capacity of 46 passengers.

each mode's cost per seat mile--Amtrak's being three times greater than bus's and 50 percent greater than air's. In short, improvements in load factors could not, by themselves, offset Amtrak's substantial relative cost disadvantage.

Labor Costs

High labor costs are also often cited as a source of Amtrak's relative cost disadvantage. Amtrak's labor costs (corrected, for purposes of analysis, for traffic volumes and service levels) are significantly higher than those of bus or air. Amtrak's labor costs, both per seat mile and per passenger mile, far outstrip those of the bus and airline industries (see Table 5). Labor costs per Amtrak seat mile are more than twice those of air and bus. On a passenger-mile basis, Amtrak's labor costs are more than twice those of air and more than triple those of bus.

Amtrak does not pay unusually high costs per labor year, however. In 1980, Amtrak's average annual costs per worker was $27,000, compared with $24,000 in the bus industry and $33,000 in the airline industry. What drives Amtrak's labor cost up are the labor intensity and restrictive work rules that have characterized rail passenger operations.

TABLE 5. COMPARISON OF LABOR COSTS AND LABOR INTENSITY OF COMMON CARRIER INTERCITY PASSENGER MODES (Calendar year 1980 for bus and airline and fiscal year 1980 for Amtrak)

Mode	Labor Costs (In millions of dollars)	Labor Costs (In dollars) Per Seat Mile	Labor Costs (In dollars) Per Passenger Mile	Labor Years Employed	Thousands (Thousand of) Seat Miles per Labor Year	Thousands (Thousand of) Passenger Miles per Labor Year
Amtrak	657.0	0.07	0.14	24,500	388	186
Bus	757.0	0.02	0.04	31,190	1,148	555
Air	10,800.0	0.03	0.05	339,378	1,047	612

SOURCES: See Table 3. Also see Air Transport Association, Air Transport 1981 (June 15, 1981).

Compared with other common carrier modes, Amtrak is extremely labor intensive. Amtrak's output (whether measured either in seat miles or in passenger miles) per labor year compares poorly with that of the airline and bus industries. The bus and air industries' output per labor year (measured in passenger and seat miles) are about triple Amtrak's.

Certain features of railroad labor agreements contribute to Amtrak's labor intensiveness and hence, to costs. A railroad engine crew typically receives a full day's pay for a 100-mile trip. So, at an average speed of 40 miles per hour, a two-man crew costs two days' pay for a two-and-a-half-hour run. Similar agreements increase the cost of train crews. For example, a 1978 study by the General Accounting Office examined the costs of Amtrak train number 355 from Detroit to Chicago. 4/ For a five-hour and 40 minute trip, the two two-man engine crews altogether received 5.6 days' pay (an average of 1.4 days' pay per crew member), and the two-man train crew each received just under two days' pay. The on-board service crew of three employees was paid on an hourly basis with a guaranteed 180 hours of pay per month. All in all, a trip that required less

4. See General Accounting Office, "Should Amtrak Develop High-Speed Corridor Service Outside the Northeast?" Report No. CED-78-67 (1978), p. 20.

than 40 labor-hours cost Amtrak more than 66 labor-hours in pay. Not all Amtrak employees work under such costly contract provisions, of course, since labor contracts vary among the operating railroads and the crafts. But such arrangements do pervade the system, and they are very costly to Amtrak.

Amtrak is currently devoting substantial effort to reducing its labor costs. Even if Amtrak's labor costs had been reduced by one-half--or $328 million--in fiscal year 1980 with no change in service levels, however, Amtrak's costs per passenger mile would continue to be far greater than other modes' (18 cents per passenger mile, compared with 8 cents for bus and 12 cents for air). Similarly, if Amtrak could retain its 1980 service levels while using only one-half its labor, Amtrak's labor productivity would still be less than that of either the bus or airline industries. Amtrak would provide only 776,000 seat miles per labor year, compared with bus's 1,148,000 and air's 1,047,000. Moreover, achievable labor improvements fall short of the savings in these illustrations. Amtrak recently announced wage settlements with six unions, which Amtrak estimates could save about $132 million over the next three years, or roughly 6 to 7 percent of Amtrak's total labor costs.

Capital Intensiveness

High capital costs also drive up Amtrak's costs. Since Amtrak's formation in 1972, the system has spent an estimated $1.2 billion to fund equipment purchases--$919 million for passenger equipment and $293 million for motive power. In addition, Amtrak has spent about $426 million in capital on stations and other facilities, rights of way, and so forth.

In addition, Amtrak also incurs large maintenance costs on its capital stock. In fact, Amtrak spends more for maintenance than it does for train operations. Fully 28 percent of Amtrak's operating costs in fiscal year 1980--more than $327 million--went for equipment maintenance. Beyond that, $90.5 million, or about 8 percent, was expended for maintenance of tracks and yards. Thus, more than one-third of Amtrak's total operating costs went to maintain its plant and equipment.

The high costs associated with Amtrak's capital stock--both initial investment costs and ongoing maintenance requirements--could potentially be alleviated by improving its use of equipment. Equipment utilization typically refers to the numbers of hours that a given piece of equipment is used--the more hours of service per day, the higher the utilization rates. Another way of viewing utilization rates is on the basis of trips (or seat trips) delivered. In this respect, Amtrak suffers from poor equipment utilization rates. For example, Amtrak runs six trains a week (with an

average seating capacity of 350) between Chicago and Seattle, providing a total of 110,000 seat trips per year. The one-way trip takes about 45 hours. A substantial amount of rolling stock is committed exclusively to this service--a total of six locomotives, four baggage cars, three transcontinental sleeper coaches, 12 coach-superliners, three superliner dining cars, and three superliner sleeper cars--representing an investment of well over $20 million. By comparison, a Boeing 727 aircraft, with a seating capacity of about 145, makes the Chicago-Seattle run in just over four hours. This plane, which would cost about $16.5 million today, can provide four one-way trips daily between Chicago and Seattle.

Amtrak's poor equipment utilization relative to the airline industry's is attributable in large part to the relatively slow speeds of train travel. Rail's slowness results in poor turnaround times for equipment and necessitates comparatively expensive equipment and services on long-distance routes. To enhance the comfort and attractiveness of train travel, Amtrak offers relatively expensive (both in terms of capital costs and labor requirements) sleeper and dining cars on its long-distance services.

Intercity buses travel at roughly the same speeds as rail: bus service between Chicago and Seattle, for instance, takes somewhat more than two days. The capital cost of an intercity bus is relatively low, however. An intercity bus with a seating capacity of about 46 passengers costs about $125,000. Assuming that a single bus can make two trips between Chicago and Seattle each week, about 23 buses would be required to provide the same number of seat miles now offered by Amtrak. Moreover, these buses could offer more frequent service between Chicago and Seattle.

Amtrak could improve its use of capital by reducing its use of nonessential dining and sleeping cars, by using cars with greater passenger capacity, and by limiting operations to short-haul services. Concentrating on shorter distances would enable Amtrak to speed up equipment turnaround times and offer more frequent service. Nonetheless, the inherent capital intensity of rail operations would probably preclude major improvements in Amtrak's capital use rates.

AMTRAK REVENUES--PAST EXPERIENCE AND FUTURE PROSPECTS

Raising revenues is another avenue Amtrak could explore to diminish its dependency on federal support. Amtrak substantially increased its passenger revenues between fiscal years 1972 and 1980--from $153 million 5/ to $411 million, an increase of 52 percent after inflation. Further

5. Or $271 million in constant 1980 dollars.

increases were realized in fiscal year 1981, as passenger revenues rose by $65 million (almost 16 percent) over fiscal year 1980 levels. Nevertheless, still greater revenue increases would be necessary to reduce Amtrak's reliance on federal subsidies while retaining current service levels. The following sections review the potential for augmenting Amtrak's future revenues by increasing both ridership and fares.

Increased Load Factors

Although intercity travel will continue to increase overall in future years, this expansion will probably lose momentum because of slow population growth, high fuel prices, and slow growth in families' incomes. As a result, any substantial rise in Amtrak patronage would have to come from expanding Amtrak's share of a slow-growth market. Amtrak would have to capture an appreciably larger share of the intercity travel market than it holds today. Of the 1.563 trillion passenger miles that Americans now travel, Amtrak accounts for less than 1 percent. Furthermore, any future expansion would have to be attained within the constraints of Amtrak's relatively small route network; no expansion of Amtrak's route system is contemplated.

Though limited, Amtrak's network does serve many densely populated areas and heavily traveled corridors (in particular the Northeast and San Diego-Los Angeles Corridors). In theory, at least, Amtrak should fare especially well in these areas. In fact, however, Amtrak does not dominate the intercity travel market even in these populous regions. Many trips that cover Amtrak routes actually extend beyond Amtrak's lines. For example, a rider traveling from a point in Maryland to another on Long Island can make only part of his trip on the Amtrak line between Washington, D.C. and New York City; he must start and finish his trip by other modes. Thus, although he can incorporate Amtrak in his overall travel plans, he cannot make the full trip by Amtrak only. He may therefore elect another mode that simplifies his trip. Moreover, even if the two endpoints of a given trip are served by Amtrak, rail may not be a direct or convenient way to go. Rail passenger service is thus a truly viable transportation alternative for only a small proportion of all intercity trips.

To become competitive with other common carrier modes, Amtrak would either have to improve service and/or lower fares. Amtrak's ability to improve service significantly without substantially increasing costs is limited, however. As stated above, many service improvements have been accomplished during the last decade. Amtrak has markedly improved its equipment, punctuality, and route coverage. Further service improvements

will be increasingly costly. Similarly, Amtrak will probably not be able to effect a decrease in its prices relative to those of other intercity passenger modes. Although it is often argued that the relative price of Amtrak will decline as other modes suffer under the burden of likely future increases in energy prices, this may not create any appreciable financial advantage for Amtrak. 6/ Manufacturers of competing vehicles--both autos and aircraft--have already markedly improved the fuel efficiency of their products, and such improvements are likely to continue. 7/ These improvements will offset, at least partially, future fuel price increases. Moreover, the push to recover an increasing proportion of Amtrak's costs through revenues is likely to force a rapid increase in Amtrak fares. Thus, though competing modes could well experience sharp cost increases during the future, Amtrak's fares are not likely to exhibit very substantial declines relative to other modes'.

Even if Amtrak were able to improve its service significantly and keep prices low relative to those of other modes, Amtrak's ridership would not necessarily realize significant increases. The last ten years have seen major improvements in Amtrak service coupled with nearly constant prices in real terms. 8/ Despite the service improvements and steady prices (during a period punctuated by energy price shocks), Amtrak's market share did not increase but in fact, appears to have fallen slightly, from 0.5 percent of total intercity travel in 1972 to 0.3 percent in 1980. Moreover, Amtrak's decline in market share came at a time when the common carrier share of all intercity travel climbed from 12 percent in 1970 to 15 percent in 1980, presumably reflecting the increased cost of owning and operating a car. 9/

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6. Fuel accounts for a relatively small proportion of Amtrak's operating costs--about 10 percent. By comparison, fuel accounted for about 30 percent of airline operating costs and about 25 percent of the costs of owning and operating a car. Bus fuel costs represent only 8 percent of total operating costs. Thus, future increases in energy prices would have the greatest effect on the costs of airline and auto travel.

7. See for example, CBO, Fuel Economy Standards of New Cars.

8. Adjusted for inflation, Amtrak's passenger fares remained nearly constant at 8.9 cents (1980 dollars) per passenger mile in 1972 and 8.8 cents per passenger mile in 1980.

9. The major beneficiary of this shift has been the airline industry. Of trips made by common carriers, the airlines' share increased from 77 percent in 1970 to 86 percent in 1980, as the overall market expanded. By comparison, the intercity bus share of the common carrier market declined from 19 percent in 1970 to 12 percent in 1980, and rail share fell from 4 percent to 2 percent.

Thus, continued service improvements and declining relative prices may somewhat increase Amtrak ridership and slow the erosion in Amtrak's market share, but judging from Amtrak's experience to date, neither is likely to stimulate significant increases in Amtrak's share of the intercity passenger market.

Nor do population increases and income growth promise to alter this outlook substantially. Population growth over the next five to ten years will likely be concentrated in the southwestern part of the country--the Sunbelt. For the most part, Amtrak services are concentrated in the upper Midwest and Northeast--the very parts of the country that are likely to experience population losses and slowest income growth. Thus, the increases in intercity passenger travel that population growth brings will occur where Amtrak's services are most limited.

In addition, to whatever extent personal incomes grow in future years and stimulate travel, Amtrak likely will receive only a minor boost. Greater income will likely result in consumers' setting more store in speed, comfort, and convenience--thereby favoring auto and air travel over passenger rail.

Increased Fares

Higher fares, rather than increased ridership, might serve to augment Amtrak's revenues. The extent to which increased revenues can be realized through fare hikes depends on the balance between revenues gained from higher fares and those lost as passengers are discouraged by the higher prices. This balance appears to vary considerably among different routes and types of service.

In general, routes that carry a high proportion of business-related or commuter trips (specifically, the Northeast Corridor and other short-distance routes) are considered to be the least price-sensitive: fares can be increased with relatively little loss in ridership. At the same time, however, competition from other modes, particularly air, may limit Amtrak's ability to raise fares on such routes. Even travelers who are not particularly sensitive to price might switch to other modes as the price of these alternatives became competitive. In other words, as the margin between Amtrak's and other modes' prices narrows, Amtrak becomes likelier to lose riders.

On the other hand, routes that carry a high proportion of "discretionary" travel (typically, the transcontinental routes) are generally considered the most price sensitive; increased fares on these lines can meet

with considerably higher losses in ridership. Nevertheless, Amtrak may have some potential for re enue growth through higher fares on these routes. Many of Amtrak's transcontinental trains are booked to capacity during the peak summer season. 10/ So long as these services are capacity-bound, Amtrak could increase fares (at least during its peak summer season) without undue declines in ridership. On the other hand, Amtrak's managers would have to use caution not to price Amtrak out of this "discretionary travel" market.

Overall, Amtrak could probably augment its revenues through fare increases, although competition from other modes and patronage losses attributable to higher fares limit the extent to which this is practicable. Amtrak's revenues per passenger mile in fiscal year 1980 were already 2 cents higher than bus's and only 2 cents lower than air's (see Table 6). Although reliable quantitative estimates are lacking, the potential for

TABLE 6. COMPARISON OF PASSENGER REVENUES BY COMMON CARRIER MODE (Calendar year 1980 for bus and airline and fiscal year 1980 for Amtrak)

	Total Passenger (Revenues in millions)	Passenger Revenues (In dollars)	
		Per Passenger	Per Passenger Mile
Amtrak	410.5	19.40	0.09
Bus	1,157.4	8.98	0.07
Air	22,458.8	79.95	0.11

SOURCES: National Railroad Passenger Corporation, Route by Route Profit and Loss, Cost and Ridership Criteria Data for the Year Ended September 30, 1981 (February 12, 1982). Civil Aeronautics Board, Air Carrier Traffic Statistics; Month of and 12 Months Ended September 30, 1981 (September 1981). American Bus Association, Bus Facts: Intercity Bus Industry in 1980 and Decade of 1970s (1981 Editi .1).

10. This is not necessarily at variance with the statistic cited earlier that Amtrak operates at a load factor of 48 percent; that figure represents the average annual load over the entire system.

increased revenues from existing services clearly appears far below Amtrak's subsidy needs. For example, Amtrak would have needed more than $640 million in additional revenues--an increase of more than 150 percent from fiscal year 1980--if its operating subsidy (excluding capital funds) per passenger mile were reduced to the total fiscal year 1980 subsidy per passenger mile provided to commercial aviation. There is virtually no chance that Amtrak could achieve revenue increases of that magnitude under any fare policy.

CONCLUSIONS

An array of forces limits Amtrak's potential for substantially reducing its reliance on federal subsidies. The system is labor intensive, and it has relatively high equipment and maintenance costs, little latitude to raise fares or increase ridership, and virtually no opportunity to expand services without incurring additional costs.

Amtrak could nevertheless realize some limited savings through improved loads, higher fares, negotiated reductions in labor costs, and improved equipment utilization and operating productivity. Assuming that Amtrak improves its average load factor to 55 percent (about 15 percent over current levels) and increases its fares on certain routes, while negotiating a 15 percent reduction in labor costs, Amtrak's fiscal year 1983 subsidy requirement could be reduced by about $150 million or 13 percent from an estimated $1.13 billion. Even with these improvements, however, Amtrak's total subsidy needs in fiscal year 1983 would be about $980 million. 11/

Thus, as the Congress deliberates on a future budget for Amtrak, the only effective course toward substantially reducing the system's current deficit and subsidy levels appears to be the termination of services on those routes that are the most unprofitable. The next chapter lays the groundwork for identifying which of Amtrak's services would be the most appropriate candidates for reduction or elimination.

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11. This estimate includes $775 million for operating subsidies (including $80 million for interest on outstanding loans and $15 million for state and local taxes), $200 million for capital, and $5 million for labor protection payments.

CHAPTER IV. METHODS FOR EVALUATING AMTRAK'S ROUTE PERFORMANCE

Amtrak's best prospects lie in capitalizing on the system's strengths and eliminating those portions that constitute the greatest drain on resources. A route-by-route performance evaluation of the entire network therefore must underlie any decisions to trim the system. This chapter reviews Amtrak's method for identifying ("allocating") costs, revenues, and ridership by route and examines the sensitivity of individual route performance assessments to different allocation methods. The performance of three categories of service is then summarized under the different allocation methods Amtrak used in fiscal years 1980 and 1981.

AMTRAK'S DEFINITIONS AND ACCOUNTING CONVENTIONS

To provide a basis for reviewing Amtrak's route performance, the terms and accounting methods that Amtrak uses are defined. Amtrak's nomenclature and methodology serve as the basis for the Congressional Budget Office's summary of Amtrak's recent route performance.

Categories of Service

Amtrak classifies its operations into three major categories of service: Northeast Corridor routes, other short-distance routes of 500 miles or less, and long-distance routes of more than 500 miles. In 1981, the Northeast Corridor comprised five short-distance routes serving the region between Boston and Washington, D.C., including spurs in Connecticut, Massachusetts, and eastern Pennsylvania (see footnote 2 in Chapter I and the Amtrak route map inside back cover). The Northeast Corridor traverses a very densely populated and heavily traveled region; Amtrak's service reflects these high densities and volumes. The five Northeast Corridor routes alone accounted for almost half of the 291 trains operated by Amtrak in 1981 and more than half the system's passengers.

Amtrak also operated 23 short-distance routes outside the Northeast Corridor during 1981, with 11 concentrated around Chicago. Two additional routes served the Midwest outside Chicago. Five of the 23 short-distance routes were located in the Northeast but provided service off the Northeast

Corridor. The other five were located on the West Coast: two in California (Los Angeles to San Diego, and Oakland to Bakersfield), and three in Oregon and Washington (Portland to Eugene, Portland to Seattle, and Seattle to Vancouver, Washington). These routes provide service of a predominantly intraregional or local nature.

In 1981, Amtrak operated 17 long-distance routes connecting all regions of the country. Again, Chicago served as a hub: nine of the long-distance routes radiated from Chicago in all directions. Four long-distance routes carried north-south traffic along the East Coast. Two served the West, connecting Los Angeles with Seattle and Seattle with Salt Lake City. The remaining two long-distance routes linked the East and West Coasts with the Gulf of Mexico: one between New York City and New Orleans and one between Los Angeles and New Orleans.

In summary, two parts of the Amtrak system--the Northeast Corridor and the other short-distance routes--provide relatively local, intraregional service. The average passenger on the Northeast Corridor during 1981 traveled 101 miles and 133 miles on the other short-distance routes. 1/ The local character of service on these routes is also reflected in the fact that 15 of the 23 short-distance routes not on the Northeast Corridor and one of the five Northeast Corridor routes received local government subsidies in 1981. 2/ The average trip on long-distance routes measured about 634 miles in 1981. No long-distance routes received local subsidies in 1981.

Identifying Costs, Revenues, and Losses by Route

Any discussion of federal savings to be achieved by terminating service on individual routes necessarily turns on identifying the costs, revenues, and losses of each service and the portion of those costs and losses that could be avoided through service termination. The following sections therefore briefly sketch Amtrak's assignment of costs, revenues, and ridership to routes and its classification of costs as "avoidable" or "unavoidable."

Assignment of Costs, Revenues, and Ridership to Specific Routes. Amtrak's costs cannot always be clearly attributed to specific routes. A little under half of Amtrak's costs go for expenditures that are not uniquely related to any individual route. Ascribing costs to individual routes therefore entails using procedures that are necessarily somewhat inexact and arbitrary, as described below.

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1. The 90-mile leg between New York City and Philadelphia is the most heavily traveled segment on the Northeast Corridor.

2. Local subsidies for these 16 routes totaled more than $9.7 million in fiscal year 1981--2 percent of all nonfederal revenues.

Amtrak allocates most of its costs (except for general administrative overhead and interest payments on outstanding loans) to individual routes on a train-by-train basis. Costs are classified by functional activity and allocated to trains according to various formulas.

Direct expenses--such as train and engine crews, fuel and power, and so forth--can be assigned to trains relatively easily. A given train's crew costs can be estimated reasonably accurately on the basis of train miles traveled and daily wage rates specified in labor contracts. Fuel costs are estimated on the basis of numbers of miles covered and average fuel consumption rates for given types of locomotives.

Other costs, notably joint or fixed costs not directly related to any particular service, are somewhat more difficult to link to individual trains. These costs are assigned to routes using operating or service characteristics that appear most suited to explaining variations in a particular cost element. For example, sales costs are assigned on the basis of passenger boardings and deboardings; reservations costs are assigned on the basis of revenues; and certain corporate overhead costs are assigned on the basis of car miles. 3/

Revenues and ridership are similarly allocated across routes on a train-by-train basis.

The resulting allocations of costs, revenues, and ridership are not precise and may be strongly influenced by analytical assumptions. One allocation problem arises from passengers making "split trips" that involve travel on more than one route. For example, Amtrak's Zephyr runs from Chicago by way of Denver to Oakland, and the Pioneer runs between Salt Lake City and Seattle; these two routes connect in Ogden. A passenger traveling by Amtrak from Denver to Seattle traverses the Zephyr route for about a third of the total distance (to Ogden) and then the Pioneer route (from Ogden) for the remaining two-thirds of the trip to Seattle. Under Amtrak's current accounting system, such a split-trip passenger is allocated entirely to the Pioneer service. 4/ Similarly, Amtrak allocates all the

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3. Amtrak's methodology for allocating each cost element among routes is summarized in more detail in Appendix B.

4. This description reflects the situation as of April 26, 1981. Before institution of through-car service from Chicago to Seattle on that date, the Pioneer and Zephyr were treated as completely separate operations. A trip from Denver to Seattle was counted as two separate trips--one from Denver to Ogden on the Zephyr (with identifiable costs, revenues, and mileage) and a second trip from Ogden to Seattle on the Pioneer (again, with identifiable costs, revenues, and mileage).

passenger miles associated with such split trips to the Pioneer, but the train-miles measure for the Pioneer accounts only for the train miles between Ogden and Seattle. As a result, Amtrak statistics overstate the ratio of passenger miles per train mile for the Pioneer and understate this ratio for the Zephyr. For example, if a passenger boards Amtrak in Denver for the 1,622-mile trip to Seattle, the passenger's total trip mileage (1,622 miles) is reflected in the Pioneer's passenger miles, while only the Ogden to Seattle train miles (1,046 miles) are included in the Pioneer's train miles. The passenger miles per train mile for that trip are therefore reported as 1.55 passenger miles per train mile on the Pioneer instead of the actual 1.0 passenger mile per train mile. At the same time, the passenger miles per train mile carried by the Zephyr are understated.

Similarly, the revenues and incremental costs associated with carrying these split-trip passengers on the Zephyr portion of the trip are attributed to the Pioneer. These passengers' incremental costs to the Zephyr are defined, however, only as the passenger-related costs (ticketing, passenger service, and so forth). None of the train operating costs incurred by the Zephyr (such as engine crew or fuel costs) are allocated to these split-trip passengers. Thus, although all the revenues associated with the Zephyr portion of the trip are attributed to the Pioneer, only a portion of the operating costs of the Zephyr trip are similarly allocated. The Pioneer's reported financial performance is thereby enhanced by this allocation and the Zephyr's performance is downgraded.

Allocation problems also arise when a given segment of a route or service accounts for a disproportionate share of that route's revenues, costs, or passengers. For example, the Colonial (which runs from Boston to Newport News) is classified by Amtrak as long-distance service. Despite classification as long-distance service, however, the Colonial carries a lot of short-haul traffic along the Northeast Corridor. Leaving Boston daily during the morning rush hour, the Colonial stops at 16 stations between Boston and Washington, D.C. (including Providence, New Haven, New York City, Newark, Trenton, Philadelphia, Wilmington, and Baltimore). Attributing all costs, revenues, and passengers realized along this route to the Colonial therefore gives an inaccurate profit-and-loss picture of long-distance service. Instead, as of 1981, Amtrak began identifying the costs, revenues, and losses for the Colonial (as well as several other long-distance routes) on a segment basis. Under this methodology, the strictly intra-corridor revenues, passengers, and costs are allocated to the Northeast Corridor. Only the incremental revenues, costs, and riders realized by extending the route from Washington, D.C. to Newport News are allocated to the long-distance Colonial service.

This allocation does not provide a wholly accurate picture of route performance on a segment basis, however. For example, under this

accounting method, the passenger-miles-per-train-mile measure is skewed in favor of the long-haul service. Amtrak allocates all long-haul passenger miles on the Colonial (including those that pass through the corridor) to the long-haul segment, but the train-miles measure accounts only for the train miles between Washington, D.C. and Newport News. Specifically, if a passenger boards the train in Boston for the 647 mile trip to Newport News, that passenger's total trip miles (647 miles) are reflected in the long-haul service's passenger miles. By comparison, only the Washington, D.C.-to-Newport News train miles (191 miles) are incorporated in the long-haul service's train miles. Under this accounting method, if Amtrak carries only one passenger from Boston to Newport News, the passenger miles per train mile would be 3.39 for the long-haul segment and zero for the short-haul segment (instead of the actual 1.0 passenger mile per train mile for the entire 647-mile trip).

Classification of Avoidable and Fixed Costs. Another critical element in evaluating the potential cost savings associated with reductions in Amtrak service centers around the definition of costs. In particular, three definitions or measures are essential to assessing potential cost savings:

- Short-run avoidable costs (for brevity, referred to simply as avoidable costs), which are costs that Amtrak estimates could be eliminated immediately by closing down a single route. This category includes costs for crews, supplies, and fuel.

- Long-term avoidable costs, which are costs that Amtrak estimates could be eliminated within several years after a route is terminated. For example, the cost of maintaining an engine is classified as a long-term avoidable cost. Amtrak estimates that long-run cost savings from reductions in service are equal to 21.25 percent of the short-run avoidable cost for the given route.

- Fixed costs, which are costs that Amtrak estimates could not be avoided if service on a single route were terminated. These costs generally include overhead expenses such as corporate operation, facility-related maintenance, and maintenance-of-way.

As with the practice of isolating costs, revenues, and ridership by route, the classification of costs as avoidable or fixed is also somewhat arbitrary. Amtrak estimates its avoidable costs on a route-by-route basis, defining only those costs that would be avoided if service were discontinued on a specific route. A failing in this method, however, is that it overlooks some costs that could be avoided if Amtrak substantially altered its route system. In particular, it ignores those costs that are unavoidable when service is terminated on a single route but that could be avoided if several

routes were terminated. As a result, Amtrak's definitions overstate the fixed costs that would persist even with major route reductions. For example, if two routes use a particular station, the costs of that station are not identified by Amtrak as an avoidable item. Termination of either one of the routes would not eliminate this cost, since the station would still be needed for the other route. If both routes were eliminated, though, the station could be closed. These potential savings are not reflected in Amtrak's avoidable cost estimates. Instead, Amtrak includes the costs of joint-facilities (such as a station that serves two routes) among its unavoidable fixed costs. Because of such accounting conventions, the savings associated with major route reductions are greater than are indicated by Amtrak's estimates of avoidable costs.

In summary, while Amtrak's route-by-route data provide the best information now available for evaluating the relative performance of different Amtrak services, the usefulness of these data may be limited by Amtrak's definitions and allocation methods. The following discussion reviews the sensitivity of measured route performance to different allocation methods and assumptions.

SENSITIVITY OF ROUTE PERFORMANCE MEASURES TO ALLOCATION METHODS

The allocation of costs, revenues, and passengers across a system of interconnecting routes is a difficult task and necessarily requires making some problematic, and at times arbitrary, assumptions. The critical issue, though, is the sensitivity of the resulting measures of individual route performance to different allocation methods.

Different allocation methods and assumptions can, in fact, have a significant impact on the measured performance of individual Amtrak routes. Based on Amtrak's route profitability statements for 1980 and 1981, the Montrealer (from Washington, D.C. to Montreal), for example, showed considerable improvement in performance over the two-year period. This route's fully allocated federal loss declined by almost 16 percent, its short-term avoidable federal loss declined by almost 7 percent, and its passenger miles per train mile increased by almost 54 percent. These changes apparently did not result from real performance improvements, however. In fact, they reflect the changes in Amtrak's allocation and accounting methods described below.

Amtrak currently identifies the costs, revenues, and losses for the Montrealer on a segment basis. The strictly Northeast Corridor revenues,

costs, and riders are allocated to the corridor alone. Only the incremental revenues, costs, and riders realized by extending the route from Boston to Montreal are allocated to the long-distance service. During 1980, however, Amtrak applied a different allocation method to the Montrealer--Amtrak allocated all costs, revenues, and riders on trains running between Washington, D.C. and Montreal to the Montrealer service. Costs, revenues, and riders were not allocated on a segment (short-haul versus long-haul) basis. The Montrealer's performance in 1980 and 1981 was thus measured using different allocation methods.

The apparent improvement in the Montrealer's performance between 1980 and 1981 seems to stem from these different allocation methods, not from real declines in financial losses or increases in ridership. When the same allocation method is applied to the Montrealer for both years, its short-term avoidable federal loss actually appears to increase by 15 percent from 1980 to 1981 (instead of the 7 percent decline reflected in Amtrak's route profitability statements), while its passenger-miles-per-train-mile measure falls by 2 percent (instead of posting a 54 percent increase). Table 7 compares several performance measures for the Montrealer in 1980 (under both the old and current allocation methods) and 1981.

The allocation or accounting methods used by Amtrak can thus have a significant influence on performance measures for individual routes. Moreover, continual adjustments in Amtrak's allocation or accounting methods make year-to-year comparisons of a given route's performance difficult, if not inaccurate. For example, recent statements to the effect that Amtrak has improved its productivity in terms of passenger miles per train mile on long-distance trains, resulting in an increase from 175 passengers per train mile in 1980 to 195 passengers per train mile in 1981, are misleading in light of the changes in Amtrak's allocation methods outlined above. 5/ This improvement appears attributable largely to the described change in allocation methods. Notably, passenger miles per train mile over the entire Amtrak system improved only slightly during this period, from 153 passenger miles per train mile in 1980 to 155 in 1981. Comparisons of Amtrak's performance across routes and years should thus be made with caution and sensitivity to the biases that can be introduced by different allocation and accounting methods.

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5. See for example, statement of Alan S. Boyd, President, National Railroad Passenger Corporation, before the U.S. House of Representatives Committee on Appropriations, Subcommittee on Transportation and Related Agencies, March 29-30, 1982.

TABLE 7. THE MONTREALER'S PERFORMANCE IN 1980 UNDER TWO ALLOCATION METHODS COMPARED TO 1981 PERFORMANCE

	Fiscal Year 1980 Performance		
	Old (1980) Allocation Method	Current (1981) Allocation Method	Fiscal Year 1981 Performance
Total Revenue (In millions of dollars)	9.1	5.9	6.8
Avoidable Cost (In millions of dollars)	11.7	7.9	9.2
Avoidable Loss (In millions of dollars)	2.5	2.0	2.3
Passenger Miles (In millions)	96	68	67
Passenger Miles per Train Mile	194	303	298
Avoidable Loss per Passenger Mile (In dollars)	0.026	0.029	0.035

SOURCE: Data provided by National Railroad Passenger Corporation.

AMTRAK'S PERFORMANCE BY SERVICE CATEGORY, FISCAL YEARS 1980 AND 1981

Despite these problems, Amtrak's route-by-route data stand as the best information now available for evaluating the relative performance of different Amtrak services. Accordingly, this section proceeds on the basis of Amtrak's route-by-route data, presenting a summary of Amtrak's performance by service category under the different allocation methods used in 1980 and 1981.

In evaluating the performance of different parts of the Amtrak system, various measures should be reviewed. Each measure offers unique

insights, but each has limitations. A balanced assessment of the performance of various Amtrak services is therefore best gained by considering the following nine measures:

- Numbers of passengers carried;
- Numbers of passenger miles carried;
- Numbers of passenger miles per train mile;
- Amounts of avoidable profit (or loss);
- Amounts of fully allocated profit (or loss);
- Amounts of federal subsidy (or fully allocated loss) per passenger;
- Amounts of federal subsidy (or fully allocated loss) per passenger mile;
- Amounts of avoidable loss per passenger mile; and
- Percent of costs recovered by revenues.

Numbers of Passengers and Passenger Miles Carried

Patronage provides a rough gauge of the benefits accruing from a given Amtrak service. The number of passengers carried measures how many people benefit from a particular service. In terms of numbers of passengers, the Northeast Corridor routes outperform other Amtrak services, accounting for 51 percent of all Amtrak ridership in 1980 and 53 percent in 1981. The other short-distance routes carried 22 percent in 1980 and 25 percent in 1981. The long-distance routes carried 27 percent of Amtrak's passengers in 1980 and 23 percent in 1981 (see Table 8).

Numbers of passenger miles carried measures the units (miles) of transportation service provided. According to this measure, the long-distance routes outperform other Amtrak services, having carried 64 percent of all passenger miles in 1980 and 63 percent in 1981. The Northeast Corridor routes carried 24 percent in 1980 and 23 percent in 1981, while other short-distance routes carried 13 percent in 1980 and 14 percent in 1981. The high proportion of passenger miles carried by long-distance services results from the greater average trip lengths on these routes. In 1981, the average passenger on long-distance routes traveled more than six times the distance covered by the average Northeast Corridor passenger and

TABLE 8. AMTRAK RIDERSHIP BY SERVICE CATEGORY
(Fiscal years 1980 and 1981)

Type of Route	Number of Passengers (In millions)		Number of Passenger Miles (In millions)		Passenger Miles per Train Mile	
	1980	1981	1980	1981	1980	1981
Northeast Corridor	10.78	10.79	1,083.04	1,091.43	153	136
Short Distance	4.61	5.05	582.65	669.71	94	91
Long Distance	5.77	4.71	2,897.91	2,981.97	175	195
Total	21.16	20.55	4,563.60	4,743.11	153a/	155 a/

SOURCES: National Railroad Passenger Corporation, Route by Route Profit and Loss, Cost and Ridership Criteria Data, Fiscal Year 1980 (January 20, 1981); Amtrak Ridership, Revenue and Yield Comparison by Route Fiscal Year-to-Date Ended September 1980 versus Last Year; and Route by Route Profit and Loss, Cost and Ridership Criteria Data for the Year Ended September 30, 1981 (February 12, 1982).

a. Weighted average.

almost five times the distance covered by the average passenger on short-distance routes. Similarly, in 1980, the average trip length on long-distance routes was five times the average trip on Northeast Corridor routes and four times the average trip on other short-distance routes.

Patronage, whether measured in numbers of passengers or passenger miles, gives a clear index of where Amtrak service is really being used. It may not, however, reflect financial performance. A route with high patronage can still incur substantial financial losses. Moreover, patronage measures do not reflect how service levels differ among routes. For example, total ridership on a train that makes four trips may be double the ridership of another train that makes only one trip. The first route has higher patronage, but the second is more fully used in that it carries more people per trip.

Passenger Miles Per Train Mile

The passenger-miles-per-train-mile measure adjusts patronage to reflect service levels. It is an easy measure to compute, and the Amtrak Reorganization Act of 1979 used it as one basis for judging route performance. 6/

In general, passenger miles per train mile are highest on long-distance routes. The Northeast Corridor routes rank second, and the remaining short-distance routes rank last. In 1981, passenger miles per train mile averaged 195 on long-distance routes, 136 on Northeast Corridor routes, and 91 on other short-distance routes. In the year before, passenger miles per train mile averaged 175 on long-distance routes compared with 153 on Northeast Corridor routes and 94 on other short-distance routes (see Table 8).

The passenger-miles-per-train-mile measure uses train miles to adjust for the amount of service provided. It is a very crude measure of service, however, since train configurations and seating capacities vary so widely among routes. For example, two routes could have the same number of passenger miles per train mile, even though one had 75 percent of its seats filled while the other had only 5[illegible] percent. Special problems arise when using this measure to compare short-distance routes with dense seating against long-distance routes that use trains with sleepers, diners, and observation and baggage cars. A better measure would thus be average load factors--the average fraction of seats occupied by passengers, or the number of passenger miles per seat mile. Amtrak does not currently include load factor statistics in its route performance reports, however.

In addition, the passenger-miles-per-train-mile measure does not reflect financial performance. In theory, a drastic reduction in fares could raise this measure by attracting an influx of new patronage. This could cause a particular route to experience severe financial losses while still scoring high in terms of passenger miles per train mile. For this reason, including more financial information is a preferable method for measuring route performance.

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6. The Amtrak Reorganization Act of 1979 stipulated that a long-distance service be discontinued if its projected avoidable loss for fiscal year 1980 exceeded 7 cents (1979 dollars) per passenger mile, and if ridership fell below 150 passenger miles per train mile. Criteria for short-distance routes were set at 9 cents (in 1979 dollars) per passenger mile and 80 passenger miles per train mile.

TABLE 9. REVENUES, COSTS, AND LOSSES BY SERVICE CATEGORY
(Fiscal years 1980 And 1981, in millions of current dollars)

	1980				
		Costs		Federal Profit (Loss)	
Type of Route	Total Revenues	Short Term Avoidable	Fully Allocated	Short Term Avoidable	Fully Allocated
Northeast Corridor	124.51	117.92	250.51	6.59	(126.00)
Short Distance	58.48	90.09	154.13	(31.62)	(95.65)
Long Distance	235.18	407.71	688.79	(172.54)	(453.61)
Total	418.16 a/	615.72 b/	1,093.43	(197.56)	(675.26)

(Continued)

a. Includes $7.69 million in state and local subsidies--$0.19 million on the Northeast Corridor and $7.50 million on other short-distance routes; excludes about $18 million in other non-transportation revenues.

b. Includes about $58 million in depreciation--an unfunded cost item--but excludes about $19 million in general administrative costs and about $31 million in interest payments.

c. Includes $9.73 million in state and local subsidies--$.28 million on the Northeast Corridor and $9.45 million on other short-distance routes; excludes about $11 million in other non-transportation revenues.

Avoidable Profit (or Loss)

To determine which routes cover their own avoidable costs and make some contribution toward covering the system's fixed costs, the avoidable cost of a given route is often compared to its revenues. In 1981, none of the service categories generated revenues in excess of their avoidable costs (see Table 9). The Northeast Corridor routes, as a group, came closest to covering their avoidable costs, falling short by less than $5.9 million. The

TABLE 9. (Continued)

	1981				
		Costs		Federal Profit (Loss)	
	Total Revenues	Short Term Avoidable	Fully Allocated	Short Term Avoidable	Fully Allocated
Northeast Corridor	143.22	149.11	339.41	(5.89)	(196.19)
Short Distance	75.95	111.93	203.71	(35.98)	(127.77)
Long Distance	266.45	405.27	719.12	(138.82)	(452.68)
Total	485.61 c/	666.30 d/	1,262.25	(180.69)	(776.63)

d. Includes about $75 million in depreciation--an unfunded cost item--but excludes about $24 million in general and administrative costs and about $60 million in interest payments.

SOURCES: National Railroad Passenger Corporation, Route by Route Profit and Loss, Cost and Ridership Criteria Data, Fiscal Year 1980 (January 20, 1981); Route by Route Profit and Loss, Cost and Ridership Criteria Data for the Year Ended September 30, 1981 (February 12, 1982); and Route Profitability Profit/Loss Summary by Train for the Fiscal Year to Data Thru September, 1981, Report No. DP 281050-020 (January 15, 1982).

NOTE: Details may not add to totals because of rounding.

Northeast Corridor routes did generate revenues in excess of their avoidable costs in 1980. By comparison, Amtrak's long-distance routes fell far short of covering their avoidable costs, accounting for a very large proportion of Amtrak's total avoidable federal loss. 7/ The long-distance routes together accounted for 87 percent of the total avoidable loss in fiscal year 1980 and

7. The avoidable federal loss is the avoidable cost minus revenues (including local subsidies).

77 percent in 1981. The short-distance routes not on the Northeast Corridor generated substantially smaller avoidable losses. In 1980, the short-distance routes together accounted for only 16 percent of Amtrak's avoidable federal loss and 20 percent in 1981.

Restricting consideration to the avoidable federal loss (or profit) understates the total federal subsidies to Amtrak operations, however. Avoidable federal loss (or profit) reflects an attempt to define the marginal (or incremental) federal cost of each route. This measure may well be appropriate in considering very marginal changes in the Amtrak route system. As noted in the foregoing discussion of Amtrak's cost definitions, however, avoidable costs are defined in a very limited sense. First, these costs represent short-run, not long-run marginal costs--a more appropriate measure of the incremental federal cost of a given route. Second, avoidable costs are defined on the basis of single-route terminations. Multiple route reductions could result in significantly greater avoidable costs for a given service reduction.

Moreover, it is notable that Amtrak's systemwide avoidable costs increased by only 8 percent from 1980 to 1981, while its fully allocated costs increased by more than 15 percent. In fact, under Amtrak's definitions, its unavoidable costs increased by 25 percent from 1980 to 1981, while its avoidable costs increased by only 8 percent. 8/ This divergence between the growth in avoidable costs and unavoidable costs is even more pronounced on Amtrak's long-distance routes. The avoidable costs attributed to long-distance routes, under Amtrak's definitions, actually declined by more than $2 million between 1980 and 1981, while the unavoidable costs attributed to long-distance routes increased by almost 12 percent from 1980 to 1981. Given this relatively large growth in unavoidable costs, it seems inappropriate and misleading to base any evaluation of Amtrak's financial performance on avoidable costs and losses only. A more appropriate measure of the total federal costs of Amtrak service is the fully allocated federal loss.

Fully Allocated Profit (Loss)

The total subsidy to each route can be estimated by weighing revenues against fully allocated costs; these include short-term avoidable costs as well as an appropriate share of long-term avoidable and fixed costs. The fully allocated profit (or loss) is the amount by which a route's revenues exceed (or fall short of) its estimated share of total costs.

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8. The costs discussed here are short-run avoidable or unavoidable costs.

None of the Amtrak routes yield revenues in excess of their fully allocated costs (see Table 9). Long-distance routes accounted for 67 percent of all fully allocated losses in 1980 and 58 percent in 1981. The Northeast Corridor routes accounted for 19 percent in 1980 and 25 percent in 1981. Other short-distance routes accounted for 14 percent in 1980 and 17 percent in 1981.

Compared to their avoidable losses, the Northeast Corridor routes made a relatively poor showing in terms of fully allocated losses. The relatively poor performance of Northeast Corridor routes on the basis of fully allocated costs--though simultaneously showing a relatively good performance on the basis of avoidable costs--reflects the fact that Amtrak classifies a large portion of Northeast Corridor costs as unavoidable or fixed, including maintenance-of-way and signal and control costs. Though the Northeast Corridor accounted for 22 percent of Amtrak's avoidable costs in 1981, it was assigned 32 percent of Amtrak's total unavoidable costs.

Despite Amtrak's assignment of a relatively large share of unavoidable costs to the Northeast Corridor, some proponents of long-distance services argue that long-distance routes appear to perform poorly because they are assigned a portion of the unavoidable Northeast Corridor costs. Amtrak did allocate a portion--about $75 million in 1980--of its Northeast Corridor costs to several long-distance routes that traverse the corridor. These long-distance trains operate over the corridor, however, and should rightfully be assigned some of the corridor's costs.

Route-by-route operating losses help to highlight which Amtrak services lose the most money. But since they do not directly reflect how much service is being provided or used, they tell only part of the story. If large benefits are being generated, large losses may be appropriate. For this reason, a review of some additional performance measures is necessary.

Federal Subsidy (or Fully Allocated Loss) Per Passenger

By examining subsidies on a per-passenger basis, it is possible to determine the level of federal support given passengers on various routes. As stated above, the Northeast Corridor routes carried more than half of all Amtrak passengers in 1980 and 1981. At the same time, these routes accounted for about one-fifth of Amtrak's fully allocated federal loss in 1980 and one-fourth in 1981. Other short-distance routes carried 22 percent of Amtrak's passengers in 1980 and 25 percent 1981, while accounting for 14 percent of Amtrak's fully allocated federal loss in 1980 and 17 percent in 1981. The long-distance routes carried 27 percent of Amtrak's passengers in 1980 and 23 percent in 1981, but accounted for about 67 percent of the fully allocated loss in 1980 and 58 percent in 1981.

As a result, the federal subsidy per passenger is generally highest on long-distance routes, averaging $79 per passenger in 1980 and more than $96 per passenger in 1981. (See Table 10). 9/ The federal subsidy per passenger on short-distance routes off the Northeast Corridor averaged about $21 in 1980 and $25 in 1981. The Northeast Corridor routes required average federal subsidies per passenger of $12 in 1980 and $18 in 1981--substantially less than the averages for either the long- or other short-distance routes.

TABLE 10. FULLY ALLOCATED LOSS BY SERVICE CATEGORY ADJUSTED BY PATRONAGE (Fiscal years 1980 and 1981)

	Fully Allocated Loss or Federal Subsidy (In current dollars)			
	Per Passenger		Per Passenger Mile	
Type of Route	1980	1981	1980	1981
Northeast Corridor Routes	11.69	18.18	0.116	0.180
Short Distance Routes	20.76	25.31	0.164	0.191
Long Distance Routes	78.62	96.17	0.157	0.152
Total (Weighted Averages)	31.92	37.80	0.148	0.164

SOURCES: National Railroad Passenger Corporation, Route by Route Profit and Loss, Cost and Ridership Criteria Data, Fiscal Year 1980, (January 20, 1981); Amtrak Ridership, Revenue and Yield Comparison by Route Fiscal Year-to-Date Ended September 1980 versus Last Year; Route by Route Profit and Loss, Cost and Ridership Criteria Data for the Year Ended September 30, 1981 (February 12, 1982); and Route Profitability Profit/Loss Summary by Train for the Fiscal Year to Date Thru September, 1981, Report No. DP 281050-020 (January 15, 1982).

NOTE: Details may not add to totals because of rounding.

9. Individual long-distance routes show wide variations, however, ranging from $50 per passenger on the Chicago to New Orleans route in 1981 to $171 on the Los Angeles to New Orleans route.

Federal Subsidy (or Fully Allocated Loss) Per Passenger Mile

Much of the route-to-route variation in per passenger subsidies is attributable to varying trip lengths. Trips averaged 502 miles on long-distance routes in 1980, 100 miles on the Northeast Corridor, and 126 miles on other short-distance routes. Similarly, in 1981, trips averaged 634 miles on long-distance routes, 101 miles on Northeast Corridor routes, and 133 miles on other short-distance routes. Thus, inasmuch as longer trips generally cost more than shorter ones, the average federal subsidy per passenger on the long-distance routes is expected to be higher than on the Northeast Corridor and other short-distance routes.

In fact, adjusted for varying trip lengths, the long-distance routes outperformed both the Northeast Corridor and the short-distance routes in 1981. Per passenger mile, the average federal subsidy totaled 15.2 cents on the long-distance routes, 18.0 cents on the Northeast Corridor, and 19.1 cents on other short-distance routes.

During 1980, however, the subsidy per passenger mile on the Northeast Corridor routes was lower than on both the short-distance and long-distance routes. In fact, the subsidy per passenger mile on long-distance routes actually declined between 1980 and 1981 (from 15.7 cents to 15.2 cents) while the per passenger mile subsidy increased by 55 percent on Northeast Corridor routes and 17 percent on short-distance routes. These shifts in the relative performance of different Amtrak services are probably attributable largely to changes in Amtrak's allocation method between 1980 and 1981.

Avoidable Profit (or Loss) Per Passenger Mile

The Amtrak Reorganization Act of 1979 applied avoidable profit (or loss) per passenger mile as one measure to determine which routes ought to be terminated (see footnote 6 above.)

Basing route terminations on the avoidable profit or loss per passenger mile may be appropriate in considering very minor changes in the Amtrak route system. As noted above in the discussion of Amtrak's cost definitions, however, avoidable costs are defined on the basis of single route terminations and do not include some costs that could be avoided if there were major route reductions. Moreover, the relatively large growth in unavoidable costs (as defined by Amtrak) between 1980 and 1981 would argue that these unavoidable costs should be accounted for in any evaluation of Amtrak's financial performance. For these reasons, this measure, as it is currently constructed, does not appear to be a particularly useful basis for making substantial redesign decisions.

TABLE 11. AVOIDABLE PROFIT (LOSS) BY SERVICE CATEGORY ADJUSTED BY PATRONAGE (Fiscal years 1980 and 1981)

Type of Route	Avoidable Federal Profit (Loss) in Dollars Per Passenger Mile	
	1980	1981
Northeast Corridor	0.006	(0.005)
Short Distance	(0.054)	(0.054)
Long Distance	(0.060)	(0.047)
Total (Weighted Averages)	(0.043)	(0.038)

SOURCES: National Railroad Passenger Corporation, Route by Route Profit and Loss, Cost and Ridership Criteria Data, Fiscal Year 1980 (January 20, 1981); and Route by Route Profit and Loss, Cost and Ridership Criteria Data for the Year Ended September 30, 1981 (February 12, 1982).

Nevertheless, when performance is evaluated in terms of avoidable loss per passenger mile (see Table 11), the Northeast Corridor routes appear to have outperformed the other short-distance and long-distance routes during both 1980 and 1981.

Cost Recovery

Cost recovery--the proportion of a route's total costs that is offset by revenues--is probably the best yardstick for comparing the performance of different Amtrak services. Of all the financial performance measures discussed here, cost recovery provides the most comprehensive and appropriate basis for channeling federal aid in a fashion that reflects variations in trip length, differences in costs among regions and classes of service, and alternative state and local policies for supporting rail passenger service.

Looking at cost recovery as the percent of total costs generated from nonfederal revenue sources serves as a convenient basis for judging the evenness of federal assistance. For example, one possible criterion for distributing federal assistance would be to offer the same fraction of federal support to any Amtrak route or service. In instances in which

TABLE 12. COST RECOVERY BY SERVICE CATEGORY (Fiscal years 1980 and 1981)

Type of Route	Percent of Fully Allocated Costs Recovered by Revenues a/ 1980	1981
Northeast Corridor	49.7	42.2
Short Distance	37.9	37.3
Long Distance	34.1	37.1
Total (Weighted Averages)	38.2	38.5

SOURCES: National Railroad Passenger Corporation, Route by Route Profit and Loss Cost and Ridership Criteria Data, Fiscal Year 1980 (January 20, 1981); Route by Route Profit and Loss, Cost and Ridership Criteria Data for the Year Ended September 30, 1981 (February 12, 1982); and Route Profitability Profit/Loss Summary by Train for the Fiscal Year to Data Thru September, 1981, Report No. DP 281050-020 (January 15, 1982).

a. Includes revenues from passenger fares and local subsidies.

passenger fares and local subsidies were enough to cover the remainder of costs, the route would be operated. When fares and local aid were insufficient, this would reflect inadequate support from the people and area served, and the route would be discontinued.

Amtrak recovered only about 38 percent of its fully allocated costs during 1980 and 1981 (see Table 12). Each $1.00 of income--either from fares or local subsidies--was matched, on average, by about $1.60 in federal subsidies. The Northeast Corridor routes recovered about 50 percent of their fully allocated costs from nonfederal sources in 1980 and about 42 percent in 1981. The short-distance routes recovered roughly 37 or 38 percent of their fully allocated costs in 1980 and 1981. The long-distance routes recovered about 34 percent of their fully allocated costs in 1980 and about 37 percent in 1981.

TABLE 13. SUMMARY OF VARIOUS MEASURES OF PERFORMANCE BY SERVICE TYPE (Fiscal years 1980 and 1981)

Performance Measure	Fiscal Year 1980			
	Total Amtrak System	Long Distance Routes	Short Distance Routes	North-east Corridor Routes
Passengers (In millions)	21.16	5.77	4.61	10.78
Passenger Miles (In billions)	4.56	2.90	0.58	1.08
Passenger Miles per Train Mile	153	175	94	153
Avoidable Federal Profit (Loss) (In millions of dollars)	(197.6)	(172.5)	(31.6)	6.6
Fully Allocated Federal Profit (Loss) (In millions of dollars)	(675.3)	(453.6)	(95.7)	(126.0)
Federal Subsidy per Passenger (In dollars)	31.92	78.62	20.76	11.69
Federal Subsidy per Passenger Mile (In dollars)	0.148	0.157	0.164	0.116
Percent of Costs Recovered from Passenger Revenues and Local Subsidies	38.2	34.1	37.9	49.7

NOTE: Dollars expressed in current dollars.

(Continued)

SUMMARY OF PERFORMANCE BY SERVICE CATEGORY

In summary, the Northeast Corridor routes, as a group, generally outperform both the other short-distance and long-distance routes (see Table 13). It is important to recognize, however, that individual route

TABLE 13. (Continued)

Performance Measure	Fiscal Year 1981			
	Total Amtrak System	Long Distance Routes	Short Distance Routes	North-east Corridor Routes
Passengers (In millions)	20.55	4.71	5.05	10.79
Passenger Miles (In billions)	4.74	2.98	0.67	1.09
Passenger Miles per Train Mile	155	195	91	136
Avoidable Federal Profit (Loss) (In millions of dollars)	(180.7)	(138.8)	(36.0)	(5.9)
Fully Allocated Federal Profit (Loss) (In millions of dollars)	(776.6)	(452.7)	(127.8)	(196.2)
Federal Subsidy per Passenger (In dollars)	37.80	96.17	25.31	18.18
Federal Subsidy per Passenger Mile (In dollars)	0.164	0.152	0.191	0.180
Percent of Costs Recovered From Passenger Revenues and Local Subsidies	38.5	37.1	37.3	42.2

SOURCES: National Railroad Passenger Corporation, Route by Route Profit and Loss, Cost and Ridership Criteria Data, Fiscal Year 1980, (January 20, 1981); Amtrak Ridership, Revenue and Yield Comparison by Route Fiscal Year-to-Date Ended September 1980 versus Last Year; Route by Route Profit and Loss, Cost and Ridership Criteria Data for the Year Ended September 30, 1981 (February 12, 1982); and Route Profitability Profit/Loss Summary by Train for the Fiscal Year to Date Thru September, 1981, Report No. DP 281050-020 (January 15, 1982).

performance varies considerably within the service categories that Amtrak designates (see Appendixes C and D). For example, some long-distance routes outperform short-distance routes on several measures. Similarly, some Northeast Corridor or other short-distance routes perform considerably less well than many long-distance routes.

Nevertheless, during both 1980 and 1981, the Northeast Corridor routes were distinct in several respects. They accounted for one-fourth or less of the fully allocated federal loss, while carrying more than half of Amtrak's passengers and about one-quarter of its passenger miles. They required a federal subsidy per passenger of less than $20--significantly less than the subsidy per passenger on other short-distance and long-distance routes. They accounted for a small proportion--only 3 percent--of the avoidable federal loss in 1981, having generated revenues in excess of their avoidable costs the year before. And they recovered a larger proportion of their costs through fares and local subsidies than did the other service categories.

At the same time, the short-distance routes not on the Northeast Corridor outperformed the long-distance routes on several measures. In particular, they accounted for a smaller share of both the fully allocated loss and the avoidable federal loss. The subsidy per passenger on short-distance routes was little more than one-fourth that on long-distance routes. Also, the short-distance routes recovered about 37 or 38 percent of their costs from nonfederal sources in 1980 and 1981--somewhat more than the percent recovered by long-distance routes.

The long-distance routes, as a group, carried the greatest number of passenger miles and had the highest passenger miles per train mile in both fiscal years 1980 and 1981. The subsidy per passenger mile on long-distance routes was less than on the short-distance routes in 1980 and less than the subsidy per passenger mile carried on both the Northeast Corridor routes and other short-distance routes in 1981.

CHAPTER V. EFFECTS OF SERVICE REDUCTIONS ON AMTRAK'S SUBSIDY NEEDS

Because the public benefits that Amtrak conveys appear limited (see Chapter II), continuing large federal subsidies is difficult to justify. Either large revenue increases or cost reductions--neither of which would be easy to achieve--would be necessary to reduce Amtrak's yearly deficits and subsidy needs. Some limited reductions could be attained by improving operations, reducing costs, and increasing ridership and fares. Substantial reductions in Amtrak's future subsidies, however, would necessitate cuts in Amtrak's service levels (see Chapter III).

The amount of savings that could be realized through Amtrak service reductions can be estimated only roughly. Such estimates are derived by identifying the costs, revenues, and losses of each Amtrak service and the portions of those costs and losses that could be avoided by service terminations. As noted earlier, however, ascribing costs to individual Amtrak routes entails procedures that are necessarily inexact and arbitrary (see Chapter IV). Moreover, the classification of costs as avoidable or fixed is also imprecise. Specifically, Amtrak estimates its avoidable costs on a route-by-route basis, defining only those costs that would be avoided if service were discontinued on a single route. This definition does not account for those costs that could be avoided if Amtrak substantially altered its route system. As a result, Amtrak's definitions overstate the fixed costs that would persist even with major service reductions and thereby understate the savings. Despite these problems, however, Amtrak's cost data stand as the best available information for estimating the savings that would accompany reductions in Amtrak services.

The extent and specifics of particular service reductions would determine the amount of savings Amtrak could realize. In general, the largest savings could be achieved by eliminating or reducing long-distance services. These routes account for the largest proportion of Amtrak's estimated avoidable loss (77 percent in 1981), and at the same time, they carry a relatively small share of Amtrak's passengers. By comparison, the Northeast Corridor routes account for a very small share of Amtrak's estimated avoidable loss--3 percent in 1981--but carry more than half of Amtrak's passengers. Reductions in long-distance service could thus substantially reduce Amtrak's subsidy needs while preserving those services that carry the largest share of passengers. For example, if the five long-distance routes

with the largest avoidable losses had been eliminated, Amtrak's subsidy needs in fiscal year 1981 would have been at least $79.7 million (or 11 percent) less, based on Amtrak's own estimates of short-term avoidable loss. Moreover, Amtrak would have realized an additional $44 million savings during subsequent years as a result of long-run cost reductions.

Additionally, some reductions in overhead or joint costs that are defined by Amtrak as unavoidable would also result. Such savings could be substantial but are largely dependent on what combination of routes are terminated. For example, if Amtrak terminated service on the routes from Los Angeles to Seattle, New York City to Florida points, and Chicago to New Orleans, the savings in overhead or joint costs would probably be limited, since these routes operate over different lines in different regions of the country. If, on the other hand, Amtrak cancelled service on its three routes in and out of New Orleans (connecting with New York City, Chicago, and Los Angeles), it could achieve significant savings in both overhead and joint costs.

The criteria used to evaluate individual route performance would determine the specific service reductions and associated cost savings realized by Amtrak. One measure that could be used is cost recovery: those routes with the lowest percentage of costs recovered from nonfederal revenues would be candidates for termination. This is in keeping with the Omnibus Reconciliation Act of 1981, which required Amtrak to recover 50 percent of its total operating costs (not counting interest payments on outstanding loans, capital costs, and labor protection costs) from nonfederal revenues starting in fiscal year 1982.

Amtrak's cost recovery performance varies considerably among individual routes. During fiscal year 1981, Amtrak's cost recovery ranged from about 13 percent on the New Haven to Springfield route to more than 63 percent on the Albany to Montreal route. Nevertheless, 17 of Amtrak's routes recovered less than one-third of their fully allocated costs in fiscal year 1981 (see Table 14). If Amtrak had discontinued service on these routes in 1981, the federal subsidy in that year could have been reduced immediately by $78.6 million, according to Amtrak estimates. An additional $39.4 million in savings would have been realized during subsequent years as a result of long-term cost reductions. Similarly, 18 routes recovered less than one-third of their costs in 1980 (see Table 14). According to Amtrak estimates, service terminations on these 18 routes would have yielded immediate savings of $149 million and an additional $66 million in subsequent years from long-term cost reductions.

During both fiscal years 1980 and 1981, several routes were among those performing worst in terms of cost recovery. Notably, however, a

TABLE 14. ROUTES RECOVERING LESS THAN ONE-THIRD OF THEIR FULLY ALLOCATED COSTS (Fiscal years 1980 and 1981)

Route	Percent of Fully Allocated Costs Recovered	Federal Loss (In thousands)		
		Short Term Avoidable	Long Term Avoidable	Fully Allocated
		(FISCAL YEAR 1980)		
Washington, D.C.-Cincinnati	21.4	2,822	3,700	4,827
New Haven-Springfield	22.5	1,234	1,786	4,708
Portland-Vancouver	25.2	1,966	2,724	4,753
Chicago-Valparaiso	25.6	365	516	1,007
Chicago-Texas Points	27.0	11,813	16,118	22,881
Chicago-Milwaukee	27.3	1,640	2,486	6,216
Los Angeles-New Orleans	27.5	8,822	12,183	18,463
Portland-Eugene	28.7	259	361	544
New York City-New Orleans	29.2	13,481	19,381	34,641
Washington, D.C.-Martinsburg	29.4	452	697	1,685
Philadelphia-Harrisburg	29.9	2,453	3,896	10,157
New York City-Florida Points	30.6	33,555	49,387	92,778
Chicago-Washington, D.C.	30.8	4,839	6,854	10,440
Chicago-New York City-Washington, D.C.	31.8	10,323	15,511	30,175
Seattle-Salt Lake City	32.0	5,282	7,508	11,023
Oakland-Bakersfield	32.3	2,808	3,934	5,220
Chicago-Oakland/Los Angeles	32.7	26,063	37,709	59,187
Chicago-Los Angeles	33.2	20,929	30,547	48,984
Total 1980	---	149,106	215,298	367,690

(Continued)

TABLE 14. (Continued)

Route	Percent of Fully Allocated Costs Recovered	Federal Loss (In thousands)		
		Short Term Avoidable	Long Term Avoidable	Fully Allocated
		(FISCAL YEAR 1981)		
New Haven-Springfield	12.9	3,277	4,307	10,563
Chicago-Valparaiso	21.0	573	795	1,778
Washington, D.C.-Cincinnati	21.1	2,968	3,908	5,438
Seattle-Vancouver	23.0	1,109	1,495	2,372
Philadelphia-Harrisburg	23.9	3,064	4,693	14,617
Portland-Eugene	24.9	1,439	1,976	3,274
Chicago-Milwaukee	25.1	1,632	2,522	7,622
Washington, .D.C.-Martinsburg	27.4	383	616	1,894
Chicago-Minneapolis	28.6	2,053	2,936	5,252
Boston-Newport News	28.9	1,237	1,966	5,384
Chicago-Peoria	29.3	581	852	1,675
New York City-New Orleans	29.4	10,259	15,807	38,020
Portland-Seattle	30.3	813	1,242	2,768
New York City-Florida Points	31.0	29,415	45,441	102,551
Los Angeles-New Orleans	31.5	7,675	11,044	17,780
Chicago-Texas Points	31.8	10,489	14,797	21,036
New York City-Philadelphia	32.2	1,660	3,649	16,215
Total 1981	---	78,627	118,046	258,239

SOURCES: See Appendixes C and D.

number of the routes would have yielded (again, by Amtrak's estimates) larger subsidy reductions in fiscal year 1980 than in the next year despite higher estimated losses. For example, termination of the route from New York City to points in Florida would have yielded immediate savings of $33.6 million in fiscal year 1980. But if service had instead been terminated one year later, the immediate savings would have been $29.4 million, or $4.2 million less. By comparison, however, the fully allocated loss attributed to this route was $9.8 million more in fiscal year 1981 than in the year before. Thus, in fiscal year 1981, Amtrak defined as avoidable a smaller share of the costs on the New York City to Florida route.

The estimated savings that would accompany Amtrak service reductions are very sensitive to the cost definitions and allocation methods Amtrak uses. Clearly, though, Amtrak could substantially lessen its subsidy needs by curtailing selected services. Any savings realized by such adjustments would be offset at least partly, however, by mandatory labor protection payments. Moreover, Amtrak points out that it would face an unspecified amount of other shut-down costs if it made appreciable reductions. The cost of labor protection payments and other system shutdown expenses would be determined largely by the extent and specifics of particular service reductions. Though these costs would at least partly offset the savings realized through route terminations, such costs would be only one-time or short-term expenses, while the savings from service reductions would continue into future years.

APPENDIX TABLES

APPENDIX TABLE A. FEDERAL SPENDING FOR INTERCITY PASSENGER TRANSPORTATION IN FISCAL YEAR 1980

Intercity Mode	Gross Federal Outlays (In millions of dollars)	Net Federal Outlays Offset by User Fees (In millions of dollars)	Number of Passenger Miles e/ (In billions)	Net Outlays per Passenger Mile (In cents)
Rail	1,064 c/	1,064 c/	4.5	23.6
Highway (All)	(6,477)	(1,316)	(1,339.8)	(0.1)
Passenger Cars a/	6,440 d/	1,282 d/	1,312.1	0.1
Intercity Bus	37 d/	34 d/	27.7	0.1
Air (All)	(3,343)	(1,069)	(218.2)	(0.5)
Commercial Aviation b/	2,496	336	203.2	0.2
General Aviation b/	847	733	15.0	4.9
Total	10,884	3,449	1,562.5	0.2

SOURCE: Congressional Budget Office.

a. Includes cars, motorcycles, pickups, and vans, but excludes all bus travel.

b. Federal Aviation Administration costs and user fees allocated between commercial aviation and general aviation based on cost allocation study prepared by FAA for 1978 and updated for 1980. User fees include interest paid on the cash balance in the Airport and Airways Trust Fund.

c. Includes Amtrak spending of $823 million and $241 million for the Northeast Corridor Improvement Project.

d. Calculated from preliminary results of the U.S. Department of Transportation highway cost allocation study as reported in "Capital Cost Allocations and User Charge Structure Options," Working Paper Number 12 (July 1981). Estimates for 1977 and 1985 were prorated for 1980. Includes effect of $1.3 billion in federal highway spending from general revenues.

e. From Transportation Association of American, "Transportation Facts and Trends" (December 1981).

APPENDIX TABLE B. DESCRIPTION OF AMTRAK'S COST ALLOCATION METHODS AND DEFINITIONS AS OF OCTOBER 1977 (With available updates and revisions)

Expense Items	Basis of Allocation to Trains	Allocated to Trains	Cost Type
Train/Engine Crew	Daily wage rate as specified in contract with each railroad combined with train miles over railroad	On operating railroad	Avoidable
Train Fuel and Power	Gallons of fuel consumed (based on average consumption rates for type of locomotive) Electric-powered car miles weighted for type of propulsion unit used	By type of equipment	Avoidable
On-Board Service Labor	Crews assigned to train	Staffed by each crew base	Avoidable
On-Board Service Supplies	Dining car revenue	Supplied by each commissary	Avoidable
Rent for Locomotives and Cars	Locomotive unit miles and car miles operated by each railroad	On operating railroad	Avoidable
Route Stations			
Ticketing and supervisory	Boardings and deboardings at station	Stopping at each station	Avoidable
Operations and passenger service	Boardings and deboardings at station	Stopping at each station	Avoidable
Station master and ushers	Boardings and deboardings at station	Stopping at each station	Avoidable
Route Stations			
Cleaning and maintenance	Car miles	Operated by each railroad	Avoidable
Shared Stations			
Ticketing	Boardings and deboardings at station	Stopping at each station	Mixed avoidable determined by schedule requirements without trains(s)
Station masters and ushers	Boardings and deboardings at station	Stopping at each station	
Red caps/porters	Boardings and deboardings at station	Stopping at each station	
Baggage, mail, and express handling	Boardings and deboardings at station	Stopping at each station	
Operations	Boardings and deboardings at station	Stopping at each station	

(Continued)

APPENDIX TABLE B. (Continued)

Expense Items	Basis of Allocation to Trains	Allocated to Trains	Cost Type
Shared Stations			
Cleaning and maintenance	Car miles	Operated by each railroad	Mixed avoidable determined by schedule requirements without train(s)
Passenger Inconvenience	Boardings and deboardings at station	Stopping at each station	Mixed avoidable determined by schedule requirements without train(s)
Transportation--Mainline Operations			
Train dispatching	Unit trips	In each transportation division	Unavoidable
Signal/interlock operation	Unit trips	In each transportation division	Unavoidable
Qualifying	Unit trips	In each transportation division	Unavoidable
Transportation--Mainline Operations			
Drawbridge operations	Unit trips	Through a maintenance-of-way division/geographic area	Unavoidable
Wreck clearance	Unit trips		Unavoidable
Transportation--Mainline Operations			
Transportation operations	Train miles or total unit trips	On operating railroad	Mixed--based on railroad contract terms
Yard Operations	Unit trips	Through each Amtrak yard or on operating railroad	Mixed--Amtrak unavoidable or per railroad contract terms
Maintenance of Equipment			
Locomotive Maintenance and Servicing			
Diesel	Diesel locomotive unit miles	In NEC (NEC costs) or off NEC (other costs)	Mixed
Electric	Electric locomotive unit miles		Mixed

(Continued)

APPENDIX TABLE B. (Continued)

Expense Items	Basis of Allocation to Trains	Allocated to Trains	Cost Type
Locomotive Heavy Repairs			
Diesel	Diesel locomotive unit miles	In NEC (NEC costs) or	Unavoidable
Electric	Electric locomotive unit miles	off NEC (other costs)	Unavoidable
Locomotive Dismantling	Locomotive unit miles	In NEC (NEC costs) or off NEC (other costs)	Unavoidable
Car Maintenance, Turbine			
Maintenance and servicing	Turbo car miles	With turbo equipment	Mixed
Heavy repairs	Turbo car miles	With turbo equipment	Unavoidable
Wreck and accident repairs	Turbo car miles	With turbo equipment	Avoidable
Passenger Cars			
Maintenance and servicing	Car miles by equipment type		Mixed
Heavy repairs	Car miles by equipment type	In NEC (NEC costs) or	Unavoidable
Wreck and accident repairs	Car miles by equipment type	off NEC (other costs)	Avoidable
Car dismantling	Car miles by equipment type		Unavoidable
Other Car Maintenance			
Exterior car cleaning	Total car miles		
Trip cleaning	Total car miles	In NEC (NEC costs) or	
Train riders	Total car miles	off NEC (other costs)	
Heavy cleaning	Total car miles		
Metroliner Maintenance			
Running maintenance and servicing	Metroliner car miles	With metroliner equipment	Mixed
Heavy repairs	Metroliner car miles	With metroliner equipment	Unavoidable
Wreck and accident repairs	Metroliner car miles	With metroliner equipment	Avoidable
Maintenance-of-Way			
Track-related maintenance (Amtrak)			
Roadway	Unit trips		Unavoidable
Track	Unit trips		Unavoidable
Public right-of-way	Unit trips	Through designated main-	Unavoidable
Snow and ice removal	Unit trips	tenance-of-way division/	Unavoidable
Tunnels	Unit trips	location	Unavoidable
Bridges, trestles, culverts	Unit trips		Unavoidable
Signs and fences	Unit trips		Unavoidable
Track-related maintenance (railroad)	Train miles	On operating railroad	Mixed--Railroad contract terms

(Continued)

APPENDIX TABLE B. (Continued)

Expense Items	Basis of Allocation to Trains	Allocated to Trains	Cost Type
Facility-related maintenance, Amtrak			
Signal and interlocker	Unit trips	Through designated maintenance-of-way division/ location	Unavoidable
Communication system	Unit trips		Unavoidable
Power transmission system	Unit trips		Unavoidable
Road buildings	Unit trips		Unavoidable
Roadway machines and equipment	Unit trips		Unavoidable
Miscellaneous buildings	Unit trips		Unavoidable
Facility-related maintenance, railroad	Train miles	On operating railroad	Mixed--Railroad contract terms
Common Facilities Overhead			
Maintenance of Equipment	Car miles/locomotive miles/ train miles	In NEC (NEC costs) or off NEC (other costs)	Unavoidable
Maintenance-of-way	Train trips (NEC) Train miles (railroad)	In NEC (NEC costs) or off NEC (other costs)	Unavoidable
Station services	Boardings and deboardings at station	Stopping at each station	Unavoidable
Transportation	Trip frequency in district (Amtrak) Train miles (railroad)	Through district (Amtrak) On operating railroad	Unavoidable
Joint terminal facilities	Train trips in district (Amtrak) Train miles (railroad)	Using each facility	Mixed
Reservations	Revenues	Systemwide	Mixed
Marketing, advertising, and sales	Train revenue or passenger boardings and deboardings	Systemwide	Unavoidable
Sales	Passenger boardings and deboardings	Systemwide and at specific stations	Unavoidable
Commissary and crew base	Dining car revenues (commissary) Wages (crew)	All trains	Mixed

(Continued)

APPENDIX TABLE B. (Continued)

Expense Items	Basis of Allocation to Trains	Allocated to Trains	Cost Type
Railroad			
Tax accrual	Train miles	Operated by each railroad	Avoidable
Health and other benefits	Train miles	Operated by each railroad	Avoidable
Pension	Train miles	Operated by each railroad	Avoidable
Liability assumption	Train miles	Operated by each railroad	Avoidable
Railroad Administration	Unit miles for a given train	Operated by each railroad	Avoidable
Contract Avoidable Expense	Total car miles for a given train	Operated by each railroad	Avoidable
Allocated Performance Payments	Actual on-time performance or total car miles (depending on contract)	Operated by given railroad	Avoidable
General Support	Car miles or passenger boardings/ deboardings	Systemwide or selected stations	Unavoidable
Procurement/Purchasing	Dining car revenue or total unit trips	Systemwide or assigned to specific location	Unavoidable
Police and Security	Unit trips	Assigned to specific locations	Unavoidable
Computer Systems	Passenger boardings	Systemwide	
Depreciation			
Road	Total unit miles	Systemwide	Unavoidable
Shop and power machinery	Total unit miles	Systemwide	Unavoidable
Other equipment	Total unit miles	Systemwide	Unavoidable
Depreciation, Locomotive	Locomotive unit miles	By type of locomotive	Unavoidable
Depreciation, Passenger Cars/ Conventional Amfleet/Superliner	Total car miles	All trains with applicable equipment	Unavoidable

(Continued)

APPENDIX TABLE B. (Continued)

Basis of Allocation Expense Items	Allocated to Trains	Cost to Trains	Type
Depreciation, Metroliner	Car miles	Metroliner	Unavoidable
Depreciation, Rail Diesel Car	Car miles	Rail diesel	Unavoidable
Depreciation, Turbine Train	Car miles	Turbo train	Unavoidable
Taxes	Car miles	Systemwide	Avoidable on rolling stock and dedicated facilities
Insurance and Claims Service	Car miles	Systemwide	Avoidable on passengers, rolling stock, and dedicated facilities
General and Administrative	Not allocated	---	---
Interest	Not allocated	---	---
Non-Train Revenue	Not allocated	---	---
Other, Including Prior Period Expenses	Not allocated	---	---

SOURCES: National Railroad Passenger Corporation, Route Profitability System: Description of Allocation Methods for Each of 90 Functional Costs (October 7, 1977), and "Guidance Memo #48," interoffice memorandum from W. Hoffman dated March 11, 1981.

APPENDIX TABLE C-1. AMTRAK'S FISCAL YEAR 1981 REVENUES, COSTS, AND LOSSES, BY ROUTE (In thousands of current dollars)

Routes, by Service Category	Revenues			Costs		Federal Profit (Loss)			Percent of Fully Allocated Costs Recovered by Revenues
	Passenger	Local Subsidies	Total	Short Term Avoidable	Fully Allocated	Short Term Avoidable	Long Term Avoidable a/	Fully Allocated	
New York City-Washington, D.C.	36,480	---	36,480	36,416	75,904	64	(7,674)	(39,424)	48.1
New Haven-Springfield	1,571	---	1,571	4,848	12,134	(3,277)	(4,307)	(10,563)	12.9
New York City-Philadelphia	7,701	---	7,701	9,361	23,917	(1,660)	(3,649)	(16,215)	32.2
Philadelphia-Harrisburg	4,323	279	4,602	7,666	19,219	(3,064)	(4,693)	(14,617)	23.9
Boston-New York City-Washington, D.C.	92,866	---	92,866	90,820	208,237	2,046	(17,253)	(115,371)	44.6
Total Northeast Corridor	142,941	279	143,220	149,111	339,411	(5,891)	(37,576)	(196,190)	42.2
Niagara Falls-New York City	15,569	56	15,626	22,769	40,732	(7,143)	(11,981)	(25,106)	38.4
Chicago-St. Louis	5,562	427	5,989	8,107	14,491	(2,118)	(3,841)	(8,502)	41.3
Chicago-Milwaukee	2,554	---	2,554	4,186	10,176	(1,632)	(2,522)	(7,622)	25.1
Chicago-Toledo	7,102	244	7,346	11,160	20,386	(3,814)	(6,185)	(13,040)	36.0
Chicago-Carbondale	2,816	446	3,262	3,949	7,713	(687)	(1,526)	(4,451)	42.3
Chicago-Quincy	1,629	776	2,405	2,503	4,633	(98)	(630)	(2,228)	51.9
Los Angeles-San Diego	9,835	1,220	11,055	14,165	27,234	(3,110)	(6,120)	(16,179)	40.6
Portland-Seattle	1,204	---	1,204	2,017	3,972	(813)	(1,242)	(2,768)	30.3
Seattle-Vancouver	707	---	707	1,816	3,079	(1,109)	(1,495)	(2,372)	23.0
Washington, D.C.-Martinsburg	715	---	715	1,098	2,609	(383)	(616)	(1,894)	27.4
Oakland-Bakersfield	2,559	1,422	3,981	6,498	9,909	(2,517)	(3,898)	(5,928)	40.2
Albany-Montreal	2,191	434	2,625	2,508	4,142	117	(416)	(1,517)	63.4
Chicago-Port Huron	2,230	1,068	3,298	3,751	6,805	(453)	(1,250)	(3,507)	48.5
Chicago-Dubuque	521	675	1,196	1,506	2,480	(310)	(630)	(1,284)	48.2
Minneapolis-Duluth	1,368	391	1,759	2,274	4,080	(515)	(998)	(2,321)	43.1
Washington, D.C.-Cincinnati	1,455	---	1,455	4,423	6,893	(2,968)	(3,908)	(5,438)	21.1
Chicago-Valparaiso	473	---	473	1,046	2,251	(573)	(795)	(1,778)	21.0
Chicago-Indianapolis	1,348	---	1,348	2,206	3,841	(858)	(1,327)	(2,493)	35.1
Chicago-Peoria	415	278	693	1,274	2,368	(581)	(852)	(1,675)	29.3
St. Louis-Kansas City	1,940	914	2,854	4,598	8,082	(1,744)	(2,721)	(5,228)	35.3
Pittsburgh-Philadelphia	1,629	583	2,212	3,390	6,120	(1,178)	(1,898)	(3,909)	36.1
Portland-Eugene	573	514	1,087	2,526	4,361	(1,439)	(1,976)	(3,274)	24.9
Chicago-Minneapolis	2,103	---	2,103	4,156	7,355	(2,053)	(2,936)	(5,252)	28.6
Total Short Distance	66,498	9,448	75,947	111,926	203,712	(35,979)	(59,763)	(127,766)	37.3

(Continued)

APPENDIX TABLE C-1. (Continued)

Routes, by Service Category	Revenues			Costs		Federal Profit (Loss)			Percent of Fully Allocated Costs Recovered by Revenues
	Passenger	Local Subsidies	Total	Short Term Avoidable	Fully Allocated	Short Term Avoidable	Long Term Avoidable a/	Fully Allocated	
Washington, D.C.-Montreal	6,843	---	6,843	9,191	16,772	(2,348)	(4,301)	(9,929)	40.8
New York City-Florida Points	46,000	---	46,000	75,415	148,551	(29,415)	(45,441)	(102,551)	31.0
Chicago-New York City/ Washington, D.C.	16,609	---	16,609	23,618	49,674	(7,009)	(12,028)	(33,065)	33.4
Chicago-Washington, D.C.- New York City	6,416	---	6,416	10,699	17,764	(4,283)	(6,557)	(11,348)	36.1
Chicago-Seattle	19,862	---	19,862	27,084	43,523	(7,222)	(12,977)	(23,661)	45.6
Chicago-Oakland	29,424	---	29,424	44,169	71,275	(14,745)	(24,131)	(41,852)	41.3
Chicago-Los Angeles	28,615	---	28,615	43,392	68,128	(14,777)	(23,998)	(39,513)	42.0
Chicago-New Orleans	9,579	---	9,579	11,968	20,598	(2,389)	(4,932)	(11,019)	46.5
Chicago-Texas Points	9,786	---	9,786	20,275	30,821	(10,489)	(14,797)	(21,036)	31.8
Los Angeles-New Orleans	8,181	---	8,181	15,856	25,961	(7,675)	(11,044)	(17,780)	31.5
Los Angeles-Seattle	26,524	---	26,524	34,284	59,198	(7,760)	(15,045)	(32,674)	44.8
Chicago-New York City/Boston	16,830	---	16,830	25,014	46,356	(8,184)	(13,499)	(29,526)	36.3
Boston-Newport News	2,192	---	2,192	3,429	7,576	(1,237)	(1,966)	(5,384)	28.9
New York City-Savannah	7,142	---	7,142	8,600	16,268	(1,458)	(3,285)	(9,126)	43.9
Seattle-Salt Lake City/Chicago	7,911	---	7,911	12,247	20,250	(4,336)	(6,938)	(12,339)	39.1
New York City-New Orleans	15,848	---	15,848	26,107	53,867	(10,259)	(15,807)	(38,020)	29.4
Los Angeles-Ogden-Chicago	8,685	---	8,685	13,917	22,541	(5,232)	(8,189)	(13,856)	38.5
Total Long Distance	266,447	---	266,447	405,265	719,123	(138,818)	(224,935)	(452,676)	37.1
TOTAL ALL ROUTES	475,886	9,728	485,614	666,302	1,262,246	(180,688)	(322,274)	(776,632)	38.5

SOURCES: National Railroad Passenger Corporation, Route by Route Profit and Loss, Cost and Ridership Criteria Data for the Year Ended September 30, 1981 (February 12, 1982); and Route Profitability Profit/Loss Summary by Train for the Fiscal Year to Date Thru September, 1981, Report No. DP 281050-020 (January 15, 1982).

NOTE: Details may not add because of rounding.

a/ Amtrak estimates that the long-term avoidable cost on any given route is 21.25 percent greater than the short-term avoidable cost.

APPENDIX TABLE C-2. SUMMARY OF AMTRAK PATRONAGE AND FINANCIAL LOSSES BY ROUTE IN FISCAL YEAR 1981

Routes, by Service Category	Numbers of Passengers (In thousands)	Numbers of Passenger Miles (In thousands)	Passenger Miles per Train Mile	Fully Allocated Federal Loss (In dollars)		Avoidable Profit (Loss) in Dollars per Passenger Mile
				Per Passenger	Per Passenger Mile	
New York City-Washington, D.C.	1,317	185,089	100	29.94	0.213	0.000
New Haven-Springfield	281	11,095	24	37.59	0.952	(0.295)
New York City-Philadelphia	2,198	115,195	314	7.38	0.141	(0.014)
Philadelphia-Harrisburg	895	44,112	63	16.33	0.331	(0.069)
Boston-New York City-Washington, D.C.	6,101	735,936	159	18.91	0.157	0.003
Total Northeast Corridor	10,792	1,091,427	136	18.18	0.180	(0.005)
Niagara Falls-New York City	770	145,941	107	32.61	0.172	(0.049)
Chicago-St. Louis	293	56,360	91	29.02	0.151	(0.038)
Chicago-Milwaukee	288	23,243	97	26.47	0.328	(0.070)
Chicago-Toledo	461	69,468	100	28.29	0.188	(0.055)
Chicago-Carbondale	180	28,635	87	24.73	0.155	(0.024)
Chicago-Quincy	85	15,052	78	26.21	0.148	(0.007)
Los Angeles-San Diego	1,202	96,010	152	13.46	0.169	(0.032)
Portland-Seattle	112	18,761	138	24.71	0.148	(0.043)
Seattle-Vancouver	83	9,088	80	28.58	0.261	(0.122)
Washington, D.C.-Martinsburg	263	11,249	184	7.20	0.168	(0.034)
Oakland-Bakersfield	174	27,521	62	34.07	0.215	(0.091)
Albany-Montreal	81	21,848	128	18.73	0.069	0.005
Chicago-Port Huron	113	20,432	88	31.04	0.172	(0.022)
Chicago-Dubuque	43	5,995	45	29.86	0.214	(0.052)
Minneapolis-Duluth	98	16,977	150	23.68	0.137	(0.030)
Washington, D.C.-Cincinnati	140	16,483	42	38.84	0.330	(0.180)
Chicago-Valparaiso	224	6,161	137	7.94	0.289	(0.093)
Chicago-Indianapolis	83	13,131	96	30.04	0.190	(0.065)
Chicago-Peoria	28	3,840	35	59.82	0.436	(0.151)
St. Louis-Kansas City	118	26,016	65	44.31	0.201	(0.067)
Pittsburgh-Philadelphia	91	15,162	52	42.96	0.258	(0.078)
Portland-Eugene	55	5,134	28	59.53	0.638	(0.280)
Chicago-Minneapolis	63	17,202	56	83.37	0.305	(0.119)
Total Short Distance	5,048	669,709	91	25.31	0.191	(0.054)

(Continued)

APPENDIX TABLE C-2. (Continued)

Routes, by Service Category	Numbers of Passengers (In thousands)	Numbers of Passenger Miles (In thousands)	Passenger Miles per Train Mile	Fully Allocated Federal Loss (In dollars)		Avoidable Profit (Loss) in Dollars per Passenger Mile
				Per Passenger	Per Passenger Mile	
Washington, D.C.-Montreal	162	67,363	298	61.29	0.147	(0.035)
New York City-Florida Points	728	523,267	226	140.87	0.196	(0.056)
Chicago-New York City/ Washington, D.C.	290	162,839	214	114.02	0.203	(0.043)
Chicago-Washington, D.C.- New York City	171	68,327	104	66.36	0.166	(0.063)
Chicago-Seattle	296	240,905	239	79.94	0.098	(0.030)
Chicago-Oakland	391	317,031	182	107.04	0.132	(0.047)
Chicago-Los Angeles	344	336,474	206	114.86	0.117	(0.044)
Chicago-New Orleans	219	110,443	164	50.32	0.100	(0.022)
Chicago-Texas Points	185	122,958	124	113.71	0.171	(0.085)
Los Angeles-New Orleans	104	103,942	163	170.96	0.171	(0.074)
Los Angeles-Seattle	592	302,158	303	55.19	0.108	(0.026)
Chicago-New York City/Boston	363	167,425	198	81.34	0.176	(0.049)
Boston-Newport News	78	19,667	146	69.03	0.274	(0.063)
New York City-Savannah	158	69,547	158	57.76	0.131	(0.021)
Seattle-Salt Lake City/Chicago	199	99,371	126	62.01	0.124	(0.044)
New York City-New Orleans	274	159,522	189	138.76	0.238	(0.064)
Los Angeles-Ogden-Chicago	153	110,731	187	90.56	0.125	(0.047)
Total Long Distance	4,707	2,981,970	195	96.17	0.152	(0.047)
TOTAL ALL ROUTES	20,547	4,743,106	155	37.80	0.164	(0.038)

SOURCES: National Railroad Passenger Corporation, Route by Route Profit and Loss, Cost and Ridership Criteria Data for the Year Ended September 30, 1981 (February 12, 1982); and Route Profitabilty Profit/Loss Summary by Train for the Fiscal Year to Date Thru September, 1981, Report No. DP 281050-020 (January 15, 1982).

NOTE: Details may not add to totals because of rounding.

APPENDIX TABLE D-1. AMTRAK'S FISCAL YEAR 1980 REVENUES, COSTS, AND LOSSES, BY ROUTE (In thousands of current dollars)

Routes, by Service Category	Revenues			Costs		Federal Profit (Loss)		Percent of Fully Allocated Costs Recovered by Revenues
	Passenger	Local Subsidies	Total	Short Term Avoidable	Fully Allocated	Short Term Avoidable	Fully Allocated	
Metroliner	40,417	---	40,417	36,411	67,754	4,006	(27,337)	59.7
NEC Conventionals	68,981	---	68,981	62,644	139,302	6,337	(70,321)	49.5
New Haven-Springfield	1,365	---	1,365	2,599	6,073	(1,234)	(4,708)	22.5
New York City-Philadelphia	7,855	---	7,855	7,806	19,271	49	(11,416)	40.8
Philadelphia-Harrisburg	4,145	191	4,336	6,789	14,493	(2,453)	(10,157)	29.9
New York City-Harrisburg	1,556	---	1,556	1,668	3,618	(112)	(2,062)	43.0
Total Northeast Corridor	124,319	191	124,510	117,917	250,511	6,593	(126,001)	49.7
Niagara Falls-New York City	12,349	180	12,529	18,678	31,757	(6,149)	(19,228)	39.5
Chicago-St. Louis	1,790	348	2,138	2,735	4,924	(597)	(2,786)	43.4
Chicago-Milwaukee	2,340	---	2,340	3,980	8,556	(1,640)	(6,216)	27.3
Chicago-Toledo	5,908	238	6,147	10,784	18,196	(4,637)	(12,049)	33.8
Chicago-Carbondale	2,406	351	2,757	3,525	6,406	(768)	(3,649)	43.0
Chicago-Quincy	1,597	566	2,163	2,344	4,100	(181)	(1,937)	52.8
Los Angeles-San Diego	8,171	1,120	9,291	11,292	19,881	(2,001)	(10,590)	46.7
Portland-Vancouver	1,601	---	1,601	3,567	6,359	(1,966)	(4,758)	25.2
Washington, D.C.-Martinsburg	702	---	702	1,154	2,387	(452)	(1,685)	29.4
Oakland-Bakersfield	1,763	728	2,490	5,298	7,710	(2,808)	(5,220)	32.3
New York City-Montreal	2,418	1,130	3,548	4,447	7,046	(899)	(3,498)	50.4
Chicago-Port Huron	1,831	1,163	2,994	3,775	6,685	(781)	(3,691)	44.8
Chicago-Dubuque	491	580	1,071	1,417	2,106	(346)	(1,035)	50.9
Chicago-Duluth	2,758	489	3,247	5,788	9,428	(2,541)	(6,181)	34.4
Washington, D.C.-Cincinnati	1,311	---	1,311	4,133	6,138	(2,822)	(4,827)	21.4
Chicago-Valparaiso	345	---	345	710	1,348	(365)	(1,003)	25.6
Chicago-Peoria	75	50	125	207	356	(82)	(231)	35.1
Chicago-Kansas City	2,404	313	2,717	4,548	7,826	(1,831)	(5,109)	34.7
Pittsburgh-Philadelphia	602	141	743	1,233	2,153	(490)	(1,410)	34.5
Portland-Eugene	121	98	219	478	763	(259)	(544)	28.7
Total Short Distance	50,983	7,495	58,478	90,093	154,125	(31,615)	(95,647)	37.9

(Continued)

APPENDIX TABLE D-1. (Continued)

Routes, by Service Category	Revenues			Costs		Federal Profit (Loss)		Percent of Fully Allocated Costs Recovered by Revenues
	Passenger	Local Subsidies	Total	Short Term Avoidable	Fully Allocated	Short Term Avoidable	Fully Allocated	
Washington, D.C.-Montreal	9,135	---	9,135	11,652	20,882	(2,517)	(11,747)	43.7
New York City-Florida Points	40,948	---	40,948	74,503	133,726	(33,555)	(92,778)	30.6
Chicago-New York City/ Washington, D.C.	14,091	---	14,091	24,414	44,266	(10,323)	(30,175)	31.8
Chicago-Washington, D.C.	4,641	---	4,641	9,480	15,081	(4,839)	(10,440)	30.8
Chicago-Seattle	14,266	---	14,266	25,551	40,108	(11,285)	(25,842)	35.6
Chicago-Oakland/Los Angeles	28,743	---	28,743	54,806	87,930	(26,063)	(59,187)	32.7
Chicago-Los Angeles	24,331	---	24,331	45,260	73,315	(20,929)	(48,984)	33.2
Chicago-New Orleans	8,497	---	8,497	10,869	17,784	(2,372)	(9,287)	47.8
Chicago-Texas Points	8,444	---	8,444	20,257	31,325	(11,813)	(22,881)	27.0
Los Angeles-New Orleans	6,994	---	6,994	15,816	25,457	(8,822)	(18,463)	27.5
Los Angeles-Seattle	20,181	---	20,181	34,154	56,565	(13,973)	(36,384)	35.7
Chicago-New York City/Boston	13,549	---	13,549	22,559	36,792	(9,010)	(23,243)	36.8
Boston-Newport News	11,772	---	11,772	9,749	20,418	2,023	(8,646)	57.7
New York City-Savannah	10,109	---	10,109	10,404	20,002	(295)	(9,893)	50.5
Seattle-Salt Lake City	5,193	---	5,193	10,475	16,216	(5,282)	(11,023)	32.0
New York City-New Orleans	14,282	---	14,282	27,763	48,923	(13,481)	(34,641)	29.2
Total Long Distance	235,176	---	235,176	407,712	688,790	(172,536)	(453,614)	34.1
TOTAL ALL ROUTES	410,478	7,686	418,164	615,722	1,093,426a/	(197,558)	(675,262)	38.2

SOURCES: National Railroad Passenger Corporation, Route by Route Profit and Loss, Cost and Ridership Criteria Data, Fiscal Year 1980 (January 20, 1981); and Route Profitability Profit/Loss Summary by Train for the Fiscal Year to Date Thru September, 1980, Report No. DP281060-040 (November 6, 1980).

NOTE: Details may not add to totals because of rounding.

a/ Includes about $58 million in depreciation--an unfunded cost item--but excludes about $19 million in general and administrative costs, about $31 million in interest payments, and about $8 million in other expenses including prior period adjustments.

APPENDIX TABLE D-2. SUMMARY OF AMTRAK PATRONAGE AND FINANCIAL LOSSES BY ROUTE IN FISCAL YEAR 1980

Routes, by Service Category	Numbers of Passengers (In thousands)	Numbers of Passenger Miles (In thousands)	Passenger Miles per Train Mile	Fully Allocated Federal Loss (In dollars)		Avoidable Profit (Loss) in Dollars
				Per Passenger	Per Passenger Mile	Per Passenger Mile
Metroliner	1,637	242,819	123	16.70	0.113	0.017
NEC Conventionals	5,120	642,809	181	13.73	0.109	0.010
New Haven-Springfield	289	10,498	35	16.29	0.449	(0.118)
New York City-Philadelphia	2,435	119,022	284	4.69	0.096	0.0004
Philadelphia-Harrisburg	1,025	51,383	71	9.91	0.198	(0.048)
New York City-Harrisburg	275	16,505	138	7.50	0.125	(0.007)
Total Northeast Corridor	10,780	1,083,036	153	11.69	0.116	0.006
Niagara Falls-New York City	703	128,913	107	27.35	0.150	(0.048)
Chicago-St. Louis	115	20,973	99	24.23	0.133	(0.029)
Chicago-Milwaukee	311	25,182	105	19.99	0.247	(0.065)
Chicago-Toledo	461	64,547	98	26.14	0.187	(0.072)
Chicago-Carbondale	172	27,200	85	21.22	0.134	(0.028)
Chicago-Quincy	99	17,355	90	19.57	0.112	(0.010)
Los Angeles-San Diego	1,233	97,218	177	8.59	0.109	(0.021)
Portland-Vancouver	162	22,444	88	29.37	0.212	(0.088)
Washington, D.C.-Martinsburg	271	11,608	193	6.22	0.145	(0.039)
Oakland-Bakersfield	137	22,728	56	38.10	0.230	(0.124)
New York City-Montreal	130	26,987	97	26.91	0.130	(0.033)
Chicago-Port Huron	107	19,175	81	34.50	0.193	(0.041)
Chicago-Dubuque	47	6,330	48	22.02	0.164	(0.055)
Chicago-Duluth	132	29,904	72	46.83	0.207	(0.085)
Washington, D.C.-Cincinnati	130	16,087	40	37.13	0.300	(0.175)
Chicago-Valparaiso	197	5,615	127	5.09	0.179	(0.065)
Chicago-Peoria	6	818	54	38.50	0.282	(0.100)
Chicago-Kansas City	147	31,549	76	34.76	0.162	(0.058)
Pittsburgh-Philadelphia	35	6,929	62	40.29	0.204	(0.071)
Portland-Eugene	12	1,083	36	45.33	0.502	(0.239)
Total Short Distance	4,607	582,645	94	20.76	0.164	(0.054)

(Continued)

trak Route Network as of January 1982

SEATTLE
PORTLAND
OAKLAND
SAN FRANCISCO
SAN JOSE
LOS ANGELES
SAN DIEGO
PHOENIX
DENVER
ST. PAUL-MINNEAPOLIS
CHICAGO
MILWAUKEE
KANSAS CITY
ST. LOUIS
INDIANAPOLIS
CIN-CINNATI
DETROIT
CLEVELAND
BUFFALO
TORONTO
MONTREAL
BOSTON
NEW YORK CITY
PHILADELPHIA
BALTIMORE
WASHINGTON, D.C.
PITTSBURGH
MEMPHIS
ATLANTA
NEW ORLEANS
HOUSTON
SAN ANTONIO
DALLAS
FORT WORTH
JACKSONVILLE
TAMPA
ST. PETERSBURG
MIAMI
1 • Enfield • Windsor Locks • Windsor • Hartford • Berlin • Meriden • Wallingford • North Haven
2 • Penn Center • 30th St. • Overbrook • Narberth • Ardmore • Bryn Mawr • Radnor • Wayne • Paoli • Malvern • Whitford • Downingtown • Coatesville • Parkesburg • Lancaster • Mount Joy • Elizabethtown • Middletown
3 • Route 128 • Providence • East Greenwich • Kingston • Westerly • Mystic • New London • Old Saybrook
4 • Whiting • Indiana Harbor • Gary • Hobart • Wheeler • Valparaiso
5 • Newark • Elkton • Perryville • Aberdeen • Edgewood
6 • Edmondson Ave. • BWI Rail Station • Odenton • Bowie • Beltway Station
7 • Fullerton (Disneyland) • Santa Ana • San Juan Capistrano • San Clemente • Oceanside • Del Mar

E: Adapted by the Congressional Budget Office from Amtrak route map published January 1, 1982.

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APPENDIX TABLE D-2. (Continued)

Routes, by Service Category	Numbers of Passengers (In thousands)	Numbers of Passenger Miles (In thousands)	Passenger Miles per Train Mile	Fully Allocated Federal Loss (In dollars)		Avoidable Profit (Loss) in Dollars
				Per Passenger	Per Passenger Mile	Per Passenger Mile
Washington, D.C.-Montreal	416	95,957	194	28.24	0.122	(0.026)
New York City-Florida Points	726	521,918	222	127.79	0.178	(0.064)
Chicago-New York City/Washington, D.C.	279	158,552	189	108.15	0.190	(0.065)
Chicago-Washington, D.C.	146	57,540	87	71.51	0.181	(0.084)
Chicago-Seattle	269	210,401	207	96.07	0.123	(0.054)
Chicago-Oakland/Los Angeles	511	346,866	150	115.83	0.171	(0.075)
Chicago-Los Angeles	327	319,166	194	149.80	0.154	(0.066)
Chicago-New Orleans	230	114,179	169	40.38	0.081	(0.021)
Chicago-Texas Points	250	117,451	97	91.52	0.195	(0.101)
Los Angeles-New Orleans	96	99,448	155	192.32	0.186	(0.089)
Los Angeles-Seattle	539	256,313	255	67.50	0.142	(0.055)
Chicago-New York City/Boston	331	157,617	182	70.22	0.148	(0.057)
Boston-Newport News	662	111,888	235	13.06	0.077	0.018
New York City-Savannah	446	108,597	179	22.18	0.091	(0.002)
Seattle-Salt Lake City	171	62,419	78	64.46	0.177	(0.085)
New York City-New Orleans	371	159,598	158	93.37	0.217	(0.085)
Total Long Distance	5,770	2,897,910	175	78.62	0.157	(0.060)
TOTAL ALL ROUTES	21,158	4,563,591	153	31.92	0.148	(0.043)

SOURCES: National Railroad Passenger Corporation, Route by Route Profit and Loss, Cost and Ridership Criteria Data, Fiscal Year 1980 (January 20, 1981); and Amtrak Ridership, Revenues, and Yield Comparison by Route Fiscal Year-to-Date Ended September 1980 versus Last Year.

NOTE: Details may not add to totals because of rounding.